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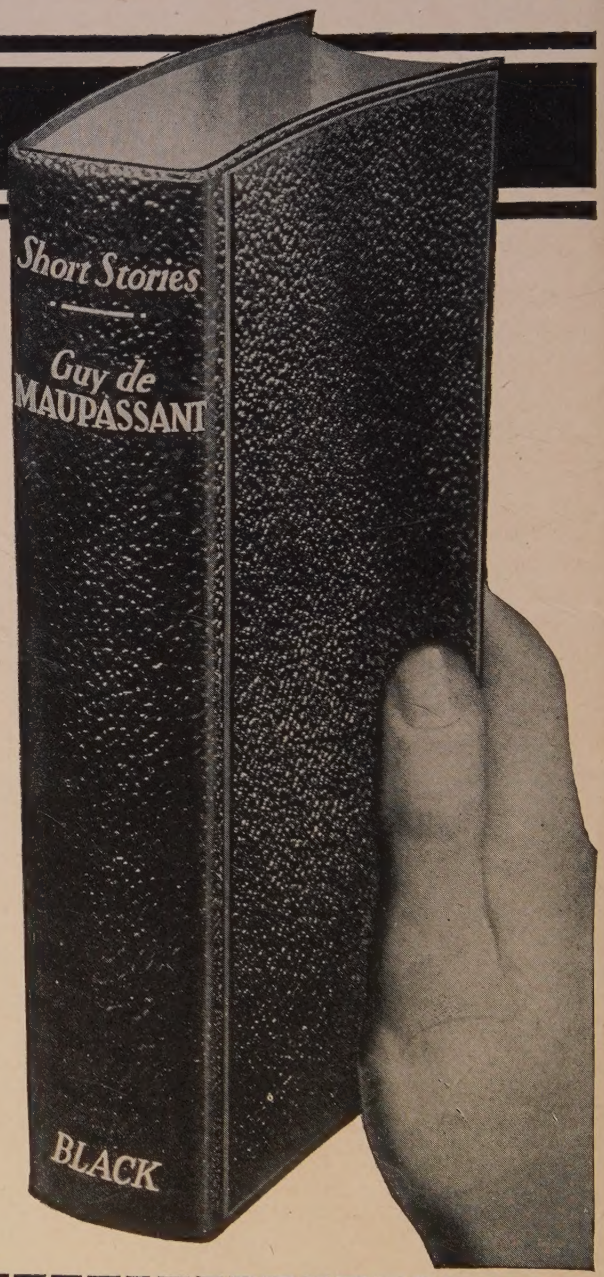

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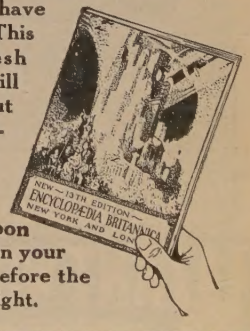

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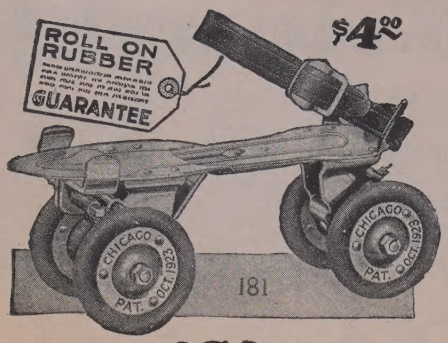

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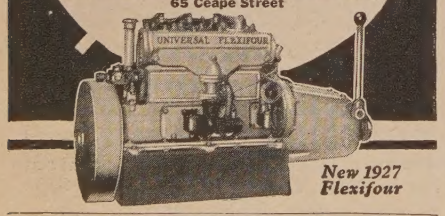

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For the Youngsters

We are sorry that we did not receive On Shiny Wings by Helen Von Kolnitz Hyer in order to review it before Christmas. It is an ideal gift for a youngster who loves the out-of-doors; but, then, there are birthdays. This little story is an imaginative adventure in Nature Land, yet one that is accurate from the natural history standpoint. Mrs. Hyer has shown herself to be a charming story-teller, with excellent taste and fine judgment of juvenile preference. This volume is written for youngsters of the fourth grade age and is one of the Naturecraft Readers published by Marshall Jones Company of Boston. The American Nature Association has an added interest in the book in that it is delightfully illustrated by its Art Director, Mr. R. Bruce Horsfall. The book sells for $1.75.

What of the Clouds?

Weather, if it departs in any way from normal, is always a front-page story in a newspaper office. It affects us all, and probably the most widely read part of any newspaper is the little tab up in the corner that presents a weather prophecy. There are signs upon which the forecaster must base his information in part, at least. The clouds tell him a story and this story Dr. W. J. Humphreys of the United States Weather Bureau has let us in on by writing a book, *Fogs and Clouds.* Williams and Wilkins Company of Baltimore has published the book, which sells for four dollars.

The volume is entertainingly written, avoiding the heavily scientific phases of meteorology and happily free from cryptic charts that scare the layman. In fact, in contrast to this method of illustration, the book boasts a remarkable collection of fine illustrations thanks to the author's life-long hobby of collecting cloud and weather pictures. They are ninety-two illustrations given excellent reproduction. We thank Dr. Humphreys for giving us an opportunity of becoming our own weather prophet. It is going to be fun.

Trees of Mexico

Of distinct scientific value is the work of Paul C. Standley in *Trees and Shrubs of Mexico,* published as Volume 23, part 5, families Bignoniaceae to Asteraceae of Contributions from the United States National Herbarium and brought out by the United States National Museum. This volume represents a tremendous labor in the cause of botany by one whose labors are always distinguished. This particular work is for the scientist and for reference purposes, and may be added to one's library at the modest cost of fifty cents in cash sent to the Superintendent of Public Documents, Washington, D. C.

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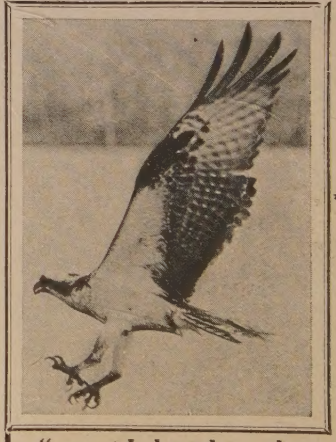

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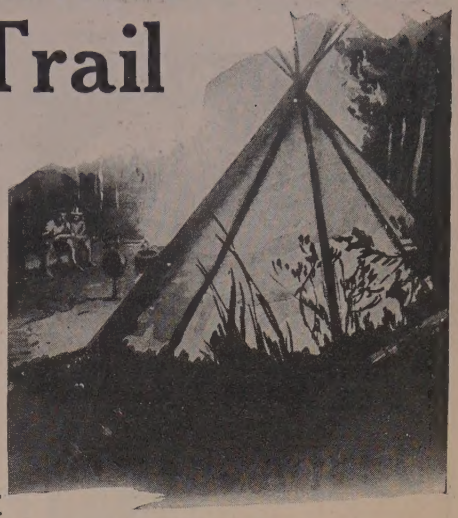

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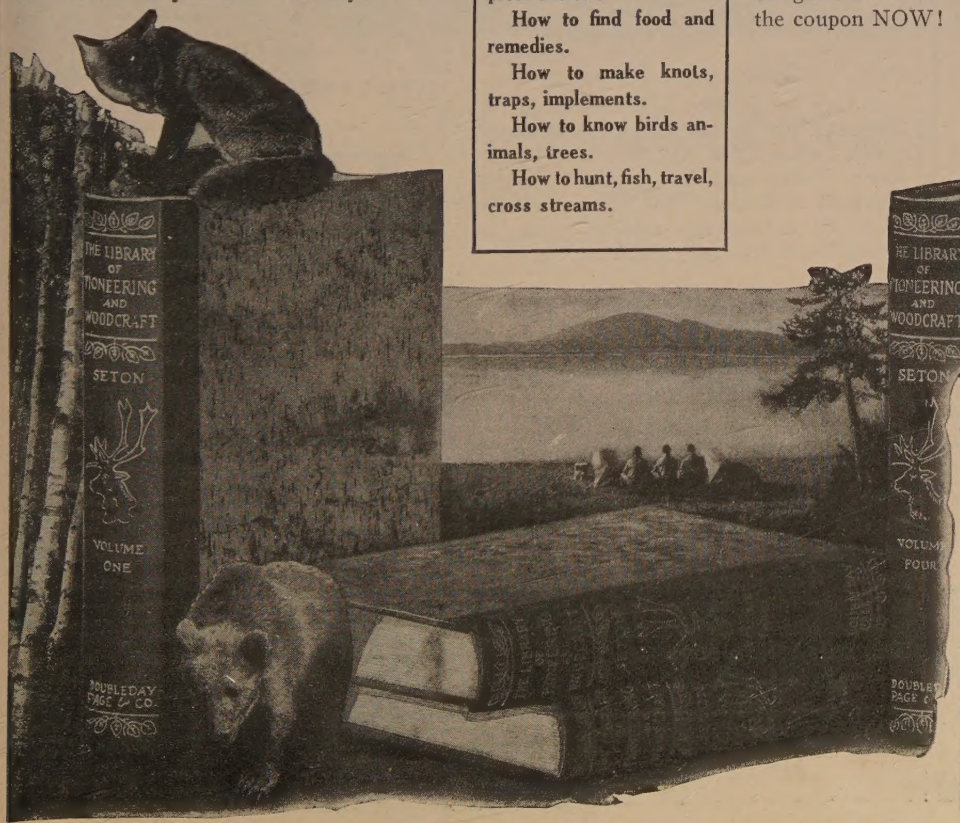

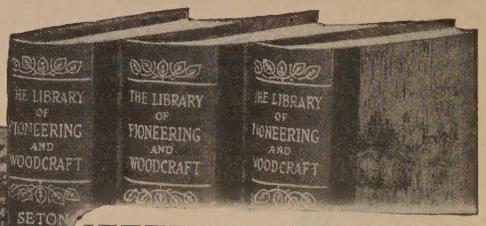
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In Tigerland

Tiger Trails in Southern Asia is the title Richard L. Sutton gives to his latest volume, which is published by The C. V. Mosby Company of St. Louis. This is a hunting book, to be sure, but one of its chief charms lies in the fine reportorial ability of its author. He is apparently a man very much alive to what is going on about him, observant of everything of natural history character and possessed of a delightful sense of humor, which finds its way into his pages. The volume does not set out to be a treatise on tigers or on Southern Asia. It is merely an entertaining story of a trip there and back, and makes an interesting evening's reading. It is well printed and illustrated, and sells for $2.25.

Some Nature Poems

A love for Nature has inspired all of the poems that appear within the covers of a little book entitled Will-O'-The-Wisps by Emma Peirce, published by the Stratford Company of Boston. The tenor of all the verses is, perhaps, best summed up in the verse, "Seek Nature," which advises:

Seek Nature in the morning,
With freshness in her look,
And seek her at the noonday,
In a cool, sequestered nook;
And do not lose the sunset,
Its lingering violet light,
Nor miss the starlit pathway
To her temple of the night.

The poems are simple, liquid and delightful. We have republished another four lines in this issue on the first text page of the magazine, suggestive as they are of the intent of the Association's expedition into the byways to seek Nature. This little volume is quoted at $1.50.

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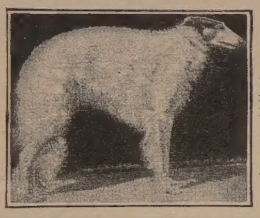

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American Nature Association

ORGANIZED TO STIMULATE PUBLIC INTEREST IN EVERY PHASE OF NATURE AND THE OUT-OF-DOORS, AND DEVOTED TO THE PRACTICAL CONSERVATION OF THE GREAT NATURAL RESOURCES OF AMERICA

The American Nature Association seeks to find for Nature Study an essential place in every School and in every American Home. It is working for Forest and Wild Life Protection along sane, economic lines. It believes that clean, healthful Out-of-Door Recreation is the key to Good Citizenship

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Nature Calendar

FEBRUARY

This is the way that the sap-river ran
From the root to the top of the tree;
Silent and dark,
Under the bark,
Working a wonderful plan
That the leaves never know
And the branches that grow
On the brink of the tide never see.
—JOHN B. TABB.

Being stout does not worry the woodchuck. He thrives on fat. It blankets him during the winter and feeds him during February if he wakes up, as he sometimes does; then he may roam many days without finding a blade of grass.

Although ice and snow still seal mother bear in her winter den, she is no longer asleep nor is she alone. Her time is occupied in caring for two or perhaps even three tiny cubs born the last of January.

Wolves do not wait for spring and a "young man's fancy." Before March young gray-wolves and timber-wolves will choose their life partners. They sometimes unite in January.

Think of traveling ten hundred miles to lay an egg! Many of the quinnat salmon are on their way to spawn in the rivers of the Sawtooth Mountains of Idaho, a thousand miles from the sea.

Ride bareback and keep your feet warm. This is the slogan of the sociable magpies who, during the deep snows in Oregon, spend much of their time perching on the backs of horses and mules.

Clark nutcrackers are all-year mountaineers. At altitudes of from five to eight thousand feet, they busy themselves in the alpine forests of the northwest prying cones from the trees and hammering off the cone scales with their bills to get at the seeds within.

Song sparrows are beginning to sing. Some sunny morning late in the month, stop and listen by the pasture, the orchard and the hedges.

"Birdie—birdie—birdie-birdiebirdie-ri-chee-r-cheer-cheer." Look for a ball of red feathers whistling from the top of a tree. The cardinal knows that the snow is melting.

The winter resorts of our migrant birds are losing their guests. Canada geese, pintail and scaup ducks, purple grackles, rusty blackbirds, red-winged blackbirds, robins and bluebirds are returning north.

Where it is not too cold, spring peepers will thaw out. Towards the end of the month, they may even begin to sing when the sun shines warm over the marshy, snow-patched fields.

River systems and chains of lakes form in sloping meadows as the water from melting snows cuts relief maps. In the wheat fields where the cuts are deep, brilliant green patches begin to show.

Ice is cleaning the creek beds. It scrubs and scrapes off all the slime and plants from the faces of the rocks and pebbles. Beneath the stones, small plants and insects lie undisturbed. These will live in the stream next summer.

Water beetles find life in bubbles. The air bubbles beneath the ice on the pond are reservoirs of oxygen for the water beetles who wake up on warm days and swim about under the thin ice.

During a thaw, watch for snow fleas. They creep up through the snow and dance in the sunlight by means of a spring-board mechanism attached to their abdomens.

Snow fleas are related to the scaly silver-fish who, with feelers before and whiskers behind, run over our pantry shelves.

On a bright day, watch for the dance of the tiny midge flies who ceaselessly flit up and down, up and down, dangling their long legs.

The earliest spring flower blooms this month. About the twenty-second, search at the base of a sparsely wooded slope for the blossom of the skunk cabbage, standing like a little gnome in its red-spattered, curled and pointed cap.

Pussy willow buds are puffing out their gray fur. Those growing in a sunny sheltered ravine may show a bit of baby pink before the month is over.

Tin buckets hang from the trees in the sugar maple grove. It is the young trees, those about thirty years old, that yield most sap. But records tell of old centenarians that have been tapped annually for over a hundred years.

The goat star, Capella, is nearly overhead at nine o'clock. To her left three dimmer stars, her little kids, gambol in the milky way.

Ursa Major has remarkable balance. Although spinning daily about the north star, watch how at nine o'clock she poises with ease on the very tip of her tail.

Prepared for Nature Magazine by the Cleveland Museum of Natural History

CUFFY AND TUFFY HELP (?) MR. FINLEY WITH HIS WORK
These two active members of the Association's expedition were natural-born investigators with a curiosity that never flagged and delight in all that was new.

NATURE MAGAZINE

Vol. IX FEBRUARY, 1927 No. 2

PROVISO TOWNSHIP HIGH SCHOOL MAYWOOD, ILL.

All the highways lead to cities,
To the traffic and the mart;
But the byways lead to Nature,
With her warmly pulsing heart.
EMMA PEIRCE

CAMERA HUNTING IN THE NORTHLAND

By William L. Finley

(Photographs by the Author)

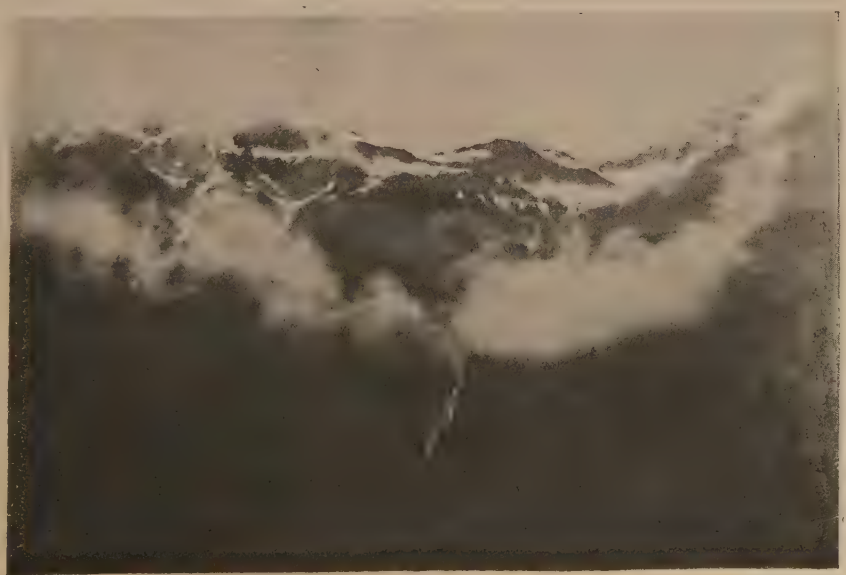
OUT into the North Pacific Ocean and the Bering Sea, Alaska stretches an arm and seems, with some ancient gesture, to have flung a spattering of islands toward Kamchatka and the Asiatic mainland. Barren lands, the Aleutians, born of Nature's volcanic whims, thrusting their rocky headlands into the seas and rearing craggy peaks, monuments to some past upheaval. Host to no trees and with scant vegetation, girt by striving waters, buffeted by winds and rift one from the other by watery passes whose hidden rocks and shifting bars defy the chart-maker, these islands and those to the north toward the Arctic Circle seem to offer little attraction to mankind.

These outposts have been but partly explored and are practically unknown to tourists, but to him who would seek out that which is different and difficult and, therefore, fascinating they offer much. Such a man is Campbell Church, whose avocation is to explore wild places, to know the thrill of cruising swift rivers and dangerous waters, and to reap the joy of seeking little-known animals of the wild. It is to him that the success of the American Nature Association expedition to the treeless islands of the Bering Sea is largely due.

This expedition was, of course, to be a hunting trip—with cameras for weapons and film for ammunition. But first there must be a yacht, sea-wise and worthy, boasting some of the conveniences necessary for a long trip. Such is the *Westward*. Wide of beam and deep of hull, rough-hewn and sturdy, eighty-six feet from stem to stern, full Diesel-powered with auxiliary sails, she is capable of going anywhere, any time. Outside she bears little resemblance to the floating palaces one may see anchored off a well known yacht club, but within are three large double cabins, roomy cupboards, electric lights, hot-water heat, and even an open fireplace. A large living room and dining saloon on deck are among her many other conveniences. Outboard motor boats, rowing skiff, power canoe, and two light river canoes complete the equipment.

Knowing the de-

With this article we go into the northland with the Finley-Church Expedition to the treeless islands of the Bering Sea under the auspices of the American Nature Association. In announcing this first article on the Expedition, the Association wishes particularly to express its appreciation of the courtesy of the Bureau of Fisheries of the United States Department of Commerce for its cooperation in placing its facilities always at the disposal of the party. The second article on the Expedition will appear in the March issue.



SEEN ALONG THE INNER PASSAGE

The beautiful scenery and alluring bays and forests of the British Columbia coast are ever there.

mands of roughing it in and about Alaska, summer or winter, Mr. Church and Campbell Church, Jr., took entire charge of equipment, crew, guides, and packers. It was left to Mrs. Finley and me to take care only of our personal equipment and the various and bulky weapons of the hunter in the way of cameras, both still and motion. For those who may be inspired to rough it in these northern lands let me say that we took light silk parkas*, knee-length; light Bristol waders to be worn over two pairs of woolen and one pair of light socks; shoe-packs for tundra tramping, with rubber soles that extend to the ankles; heavy woolen trousers, jacket, and sweaters. Lightness and warmth are the best measures of outfit.

With the details of the cruise generally mapped out, the *Westward,* bearing Mr. and Mrs. Church, with Campbell Church, Jr., and the youngsters, went on ahead to cruise leisurely up the island-bordered coast to Ikatan, where we would join them in early June. Then, on June 1, the *"Catherine D."* of the Pacific American Fisheries Company left South Bellingham, Washington, and bore us toward the beckoning arm of the south Alaskan mainland and its out-flung islands.

CAMPBELL CHURCH SERVING
Mess time aboard the *Westward* was the happiest time for Cuffy and Tuffy.

To attempt to describe the glorious panorama and primitive beauty of the Inner Passage up the British Columbia coast would be to retrace the steps of the Association's expedition of 1924. Suffice it to say that June 4 found us at Ketchikan, busy center of the southeastern coast of Alaska, and the next day we came to Icy Straits and Glacier Bay, from which we turned out of the protected passage and straight across the Gulf of Alaska to Kodiak Island.

A blue sky flecked with clouds moved with the roll of the waves. A light wind came from the west, and the glaucous-winged gulls that

* Editor's Note: Parka is an Eskimo term. It was originally a sleeved and hooded cape of sealskin or other available fur, waterproof and windproof. Parkas are now made for campers and explorers, utilizing oiled silk instead of the rare and expensive fur.

PHOTOGRAPH CAMPBELL CHURCH, JR.

THE *WESTWARD,* ROUGH-HEWN AND STURDY
She was ready to go anywhere, any time, and seemed to delight in battling the winds and waters of the Bering Sea.

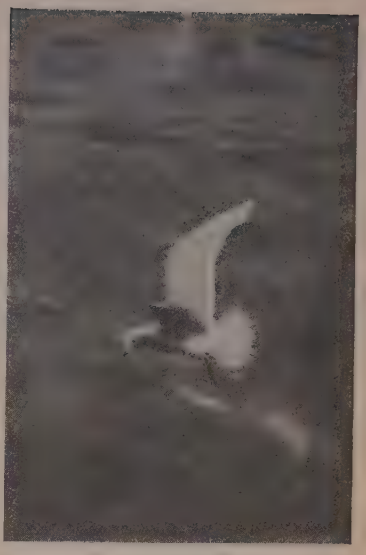
ALBATROSS OR "GOONIE"
They trailed the boat like silent shadows, at a distance.

had dogged our wake up the passage sought the open sea. Early in the morning the black-footed albatross — the "goonie" of the sailor man — took up vigil, swinging back and forth beyond the stern. Trailing like silent shadows, keeping ever at a greater distance than had the clacking, screaming, sociable gulls, these long-winged, dark gray birds played continuously at their game of skimming the crest of the water without touching it. Some were sooty black save for the white patch on the front of the head; others, perhaps older birds, showed the white rump patch and white at the base of the tail underneath.

There was another bird much like the albatross in color, shape, and mastery of flight, though smaller. This was one of the shearwaters, accustomed to hunt the northern seas in summer, but, like the albatross, nesting and rearing its young in winter on islands of the Pacific, far to the south. Though we were two hundred miles off shore, there was always bird life in sight. Several pairs of puffins or sea parrots passed us, acting a bit mystified and lost. Often there were sandpipers or plovers flitting along close over the surface of the water, and now and then a small, black bird with long wings and darting flight like the petrel.

Finally we sighted the scattering islands between Kenai Peninsula and Afognak Island, and the *"Catherine D."* entered the more protected waters of Shelikof Strait. The gold of the evening sky outlined a rugged rim of mountains off to the northwest, one a live volcano from which the smoke trailed off as from the stack of a passing steamer. Uyak Bay on the north side of Kodiak Island was reached on June 8, and the next day brought us to Chignik Bay and thence to Squaw Harbor, successful salmon fishing port on the north side of Unga Island.

It was dusk as we rounded this side of the



A SOCIABLE GULL
They followed, all clacking and screaming and always hungry.

THE ALASKA LONGSPUR
They seemed to sing continuously, chanting from the wing for lack of trees on which to perch.

THE BEARS' CABIN
Their forest home never humped and bumped like this one.

CARIBOU WERE THERE
They proved elusive animals to stalk on Unimak Island.

BABY ALEUTIAN SANDPIPER
There are many birds to be found in the northland and all of them are interesting.

island and we sighted a small boat busily exploring Pavlof Bay. It was the *Westward,* true to the agreed schedule. The next day, June 11, we boarded her at Ikatan, leaving that same afternoon for a short run to False Pass, site of a big salmon cannery. The expedition was now officially under way and the following morning we pulled away from the cannery dock to tackle the Pass itself. The northern passage between Unimak and Alaska Peninsula is wide and shallow, and there the waters of the North Pacific and the Bering Sea are in endless strife.

"Keep toward the west shore," was all the advice the captain of a cannery tender could give our skipper, Captain Albert Grove, for False Pass boasts poor charts. For a while all went well, and we were nearing the Bering Sea. Then, suddenly, came that dubious bump of a boat on hard bottom, and the *Westward* was drawn into the tide rips. Backing only swung her into shallower water, and the sand eddied about her hull. Was this to be a disastrous beginning, before we had hardly gotten under way? No, fortune was with us, for in two hours the northwest rush of tide ceased, the bar sank from under us, and we were through. Before us lay the Bering Sea!

Before we proceed further we must introduce two new members of the party, who appeared on the passenger list as Cuffy and Tuffy, and whose cabin was on the after deck in a covered box. They had joined the *Westward* at Copper River and if, indeed, Campbell Church had shanghaied them aboard, at least they were natural born members of such an expedition because of their curiosity and love of adventure. Cuffy and Tuffy were two black bear cubs, not long out of the winter den. They were not good sailors but quick to learn the ways of the sea, particularly after a rough and tumble romp had sent Cuffy overboard and made him a sadder and a wiser bear. Nevertheless, they had to be watched, for there was no mischief of which these two rascals were incapable. Their genius for exploration was limitless.

Our plan was to cruise during the day and put in to some harbor at night, anchoring on whichever side was most nearly protected from the wind. We turned in on our bunks one night with a moderate sea running, expecting to anchor about one in the morning. Soon afterward, however, the *Westward* rounded a cape, and a gale—we learned afterward that it was a sixty-miler—hit us square in the face. Everything movable aboard began hopping about and playing hide and seek under the bed. The cameras, in a solemn row along the wall, threatened disaster, and I rolled out to rescue them. The carpet seemed obligingly to rise and meet me and the ceiling threatened to thump me on the head. I thought of the many rocks outside, hidden and not, and our nearness to shore. One glance out on deck showed our craft dripping fore and aft with the spume and spindrift of the sea. New to the *Westward* then, I confess I doubted her, but after a few hours of battling and buffeting, we were again on a lee shore and the anchor slithered out.

Chapter II—Unimak Island

There is a difference between waking in the morning to gaze out at a field of clover with a cow grazing contentedly, and looking out of a porthole to see a mild-eyed, round-headed seal peering inquisitively out of the waves, or a whale blowing spray. So we awoke to an air brimming with the tang of the sea, and looked out upon the sparkling cone of Shishaldin, on whose slopes the barren-ground caribou were grazing.

The north shore of Unimak Island, uninhabited as it is from tip to tip, did not look specially inviting for our first shore camp. Several small streams wandered down

SEASICK OR CURIOUS?
Cuffy looks suspicious leaning over the side. He couldn't understand why the ground was unsteady.

from the mountains, but the forests were missing. After the manner of the Marines, however, we sent a scouting party ashore, and it brought back assurance that we could camp back from the beach under the protection of the high bank of the river. Provisions for ten days or two weeks were gathered and the next morning we made landing, set up two light tents, made beds of the thick moss, gathered considerable sea-battered driftwood, and settled down in our temporary tundra home.

In the stream by which we camped were many Dolly Varden trout, marked with red or orange spots on their sides—predatory fish, feeding on the eggs and young of salmon. They were good sport for the rod and reel, these grayhounds of the water—long, slender, and swift fighters.

Near the camp to the west lay the ruins of an old Aleut village—unoccupied, perhaps, for centuries. Its old sod houses, some round, some square, were grassed over. It might have yielded much to the ethnologist or archæologist, but our concern was with the living, not the dead.

THERE WAS SPORT FOR FISHERMEN
The Dolly Varden trout found in the stream by the camp were good fighters when hooked.

No doubt the happiest members of the party at being ashore were Cuffy and Tuffy. They spent the days rolling in the soft moss, digging up roots, and trying to keep one another from getting to the top of a sloping pole which we had put up for them, to compensate for the complete lack of trees, climbable or otherwise. They seemed to depend upon our companionship and seldom roamed far from camp. At mealtime their food was given them in two pans, but to put these dishes near together was to incite a riot which ended with food well smeared all over both wrestlers. A bath would then be in order, but the cold stream held no charms for the cubs. Strategy was necessary, and I recalled their weakness for strawberry jam. We drove a stake in the middle of the little river where the water was about a foot deep, and surmounted this makeshift goal post with a can of that delectable confection. Ice cold or not, what was mere water when the scent of jam was in the air? In went the cubs as one bear, around the can they fought and tumbled, and, lo, by the time the little can was empty the little bears were clean once more. To see or hear them fighting one would suppose that death alone could satisfy their vengeful jealousy, but those thick black coats always prevented serious damage.

Unimak, unlike the islands farther west, is the home of the barren-ground caribou and the Alaskan brown bear. We saw caribou tracks as soon as we landed, and the next morning Mrs. Finley and I set off across the tundra, hoping that, thanks to the lack of hunting of the caribou on the island, the animals would be curious rather than suspicious. From the stream bed the land sloped upward to the west for about four miles, culminating in a mountain top. To the east the tundra sloped up to a high ridge, while the head of the river valley ended in high mountains to the south. Wide meadows in places along the streams made it a typical caribou country.

Upstream from camp we sighted a herd of fifteen caribou, all bulls, some grazing and some lying down. This seemed to be the gentlemen's valley, while that to the east was occupied by cows and calves. A half-mile away they had not seen us, so down on our knees we went to work closer. Slowly we wormed our way to three hundred yards—two hundred yards—then out flared the light-colored rump patch of one of the bulls. His tail flashed into the air and he was off, the rest following, to a safe vantage point a mile away. Maneuver as we would, seeking to gain a place where the wind would carry away our scent from their keen nostrils, they were ever alert, flaring away all that day and all the next, as though to say, "You are not bears, you are of the tribe that carry guns."

CAMP WAS MADE ON UNIMAK ISLAND
The expedition landed here for its first long stop to photograph caribou and Alaska brown bears.

Camera hunting, however, requires one thing—persistence; and so we set out another morning along the old caribou trail from our camp for the marsh and lake land to the east. We gained the ridge that broke off

down to the swamp land, spotting twenty caribou on the slope. As we worked our way along, we passed some little sandpipers courting with tinkling notes of love. As we approached the caribou they separated, but we got a few long range shots with the special distance lens. Then we lay in the grass to rest, hoping that they might later feed toward us. Suddenly a big Alaska brown bear appeared, quartering down the ridge toward the lake. Caribou were forgotten, and off we started, via hands and knees, intent on photographing his brown majesty. He kept stopping to investigate the relative merits of the under sides of rocks. Each time we slipped a little nearer.

The principal advice I had had on stalking Alaska brown bear without a gun was, "Don't do it, it's bad business." But here I was, and the only equipment I had was a camera, a knapsack, and a hope that the bear had the usual natural fear of man. I wanted to get closer, and crept forward. When about seventy-five yards from the bear, I rose, and—relying on the commonly reported poor eyesight of these fellows—made a run for a nearer rock. His eyes were apparently brighter than they are credited with being, for he saw me and reared up to get a better look. Then he turned, coming back up hill and making amazingly quick time. I watched him through the finder, clicking off pictures, but when one is out of breath and a bit excited as well, it's hard to keep a hand camera steady. Bruin must have taken the long lens for a gun, because he kept on up the hill, away from me; and the camera on my knee recorded only his departure.

Like many people whom one cannot judge by first appearances, Unimak is not so forbidding as it looks at first. Its green slopes are carpeted with many wild flowers. It is summer host to many joyous song birds. Here we first met the Alaska longspur, bobolink of the northern meadows, race of the Lapland longspur which circles the world of the north wherever the barrens of the polar regions are found. Wherever we went over the tundra, these birds, rising for their aerial song, chanted on the wing for lack of trees on which to perch. We found a nest of thick grasses lined with feathers, just behind our tent. Four eggs, heavily blotched with brown, were guarded by the brown-clad mother until we came too close. The father, striking in his raiment of jet black on head and breast with a white stripe back of the eyes, his upper neck a bright reddish-brown and back streaked black and brownish, seemed constantly in ecstasy of song.

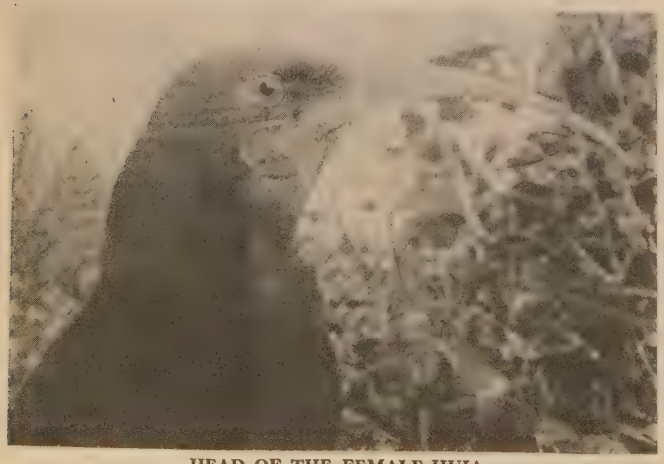
Our camp at Unimak was treated to a continuous concert, almost all day and night, for the light in the northern country gives vigor to life and inspiration to the songs of birds. Little Savannah sparrows, snowflakes, rosy finches, and other songsters of the north are at home in the fields of wonderfully-colored Arctic flowers. Food is abundant, and the days joyously long. As adventure piled upon adventure with the progress of the expedition, we were often wont to forget the treelessness of the tundras amid the beauties of northland summer.

New Zealand's Most Unique Bird

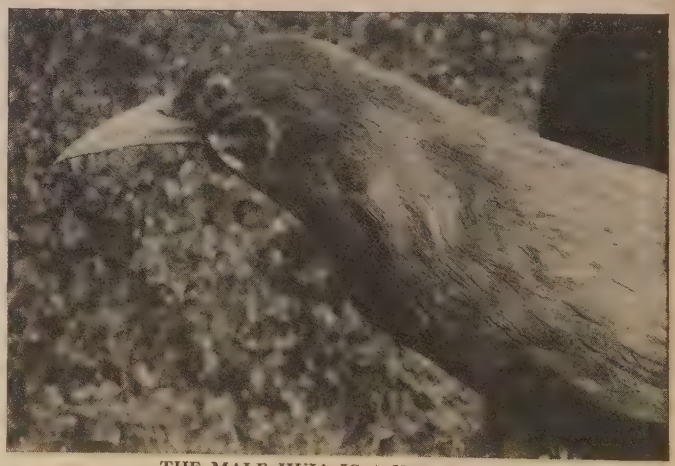
By J. C. McGill-Nutt

In a unique bird life covering some two hundred native species, including some of the most remarkable flightless birds extant, and others of unusual characteristics, the New Zealand Huia, *(Heteralocha acutirostris)*, stands out prominently as probably the most remarkable bird in the world.

The oddest thing about this strange bird is the difference in the bills of the sexes. In the male bird the bill is 2.4 inches long and remarkably hard and sharp. It is well adapted for chiselling out partly decayed wood or attacking hard barks of trees, in which the grubs forming their food supply are found. In the female the bill is more than twice as long, being nearly five inches in length, and is quite soft and pliant towards the tip. The male chisels out the dry wood, thus exposing the grub holes. When this job is finished, then the female bird, inserting her long pliant bill into the hole, takes a grip on the horny headed "huhu" and drags it carefully into the light, where the male immediately attacks it with his sharp bill, removing the harder portion of the head. The female then takes the grub in her bill, and raising it skywards swallows it whole.



HEAD OF THE FEMALE HUIA
Little is known about these birds and since they are almost extinct much will remain a mystery.



THE MALE HUIA IS A VAIN BIRD
Apparently these birds mate for life, nest in exposed tree tops and live altogether on boring insects.

Nature Through Magic Glasses

By Roy M. Allen
Microscopist

A FLY'S TONGUE ENLARGED 75 TIMES
The microscope shows the minute channels through which the food is sucked up.

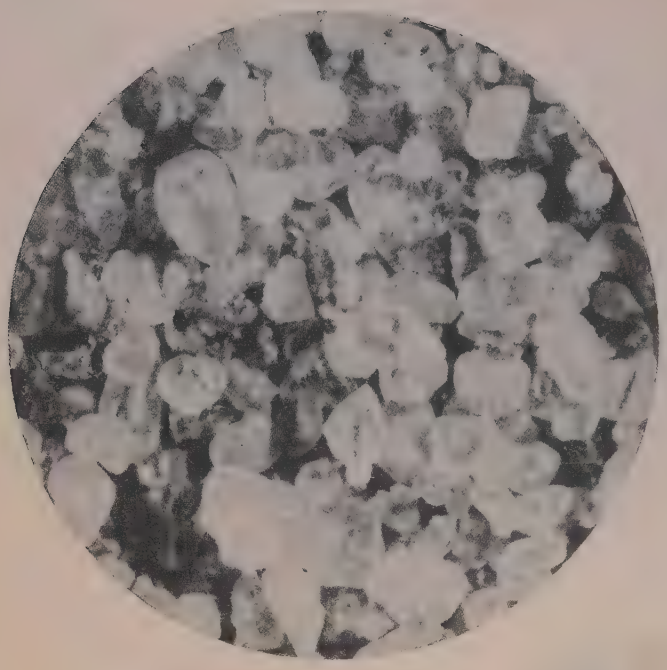
HOW would you like to own a pair of eyeglasses so powerful that they would make the eye of a needle look as big as a knot hole and a fine thread like a manila rope? Nature surely would open up all her secrets to the wearer of such a pair of glasses. While it seems like a fairy tale even to talk about them, yet that is just what a microscope is. To be sure it is too cumbersome to attach to our eyes with a wire over the ears so we do the next best thing,—provide it with a stand to support it and bring our eyes and the things we wish to look at, to it. Merely another instance of Mahomet and the mountain!

For some reason the microscope is often regarded with awe and reverence by the uninitiated, as an instrument only to be used by highbrow scientists and entirely beyond the ken of us ordinary folks. However its introduction into the schools is rapidly changing this state of affairs and the time is not far distant when every student of Nature will consider some form of microscope an essential part of his equipment. Whether one is interested in flowers or animals, minerals or trees, pond life or histology makes no difference. In every case there are times when we want to see more than the unaided eye can reveal. Sometimes it is only the lure of the unknown, but again it may be the need of recognizing some specific structure in order properly to name and classify the specimen under examination.

Suppose we look at a few objects from some of these widely different fields. However, it might be of interest to describe the instrument and explain how it works, first.

Doubtless everyone is familiar with some form of simple magnifying glass which, when held between the eye and an object, makes the latter appear larger and more easily seen. These are made in varying powers, large ones known as reading glasses which magnify only a little, and smaller forms called pocket magnifiers which are considerably more powerful. If now we conceive of a double magnifier so arranged that the first magnifies the object and the second magnifies the enlarged image formed by the first, the optical principle of the compound miscroscope is easily understood. The lens system consists of two elements, the objective which projects an enlarged image of the object just as a

A HANDKERCHIEF UNDER THE MAGIC EYEGLASS
This is how the microscope shows it with a magnification of only twenty times.



WHAT A HANDFUL OF DIAMONDS?
No, only some beach sand scooped from the aquarium and magnified twenty times.

camera lens throws an image on the film, and an eyepiece serving to magnify the image formed by the objective. The objective and eyepiece, together with the tube in which they are mounted, constitute the magic eyeglass part of the instrument. While it sounds very simple when stated this way, in actual practice there are difficulties to be overcome in producing a perfect image which make it necessary to use several,—sometimes as many as twelve,—separate lenses in a single objective. This is one reason why high-class microscopes are expensive to make and to buy.

It will be evident that with the magnifying tube we also need a table, or "stage," on which to place the object to be examined, a base with suitable supports to join the tube and stage, and means for placing the object on the stage in the exact focus of the lens system. Then if we are examining transparent objects there must be a mirror under the stage to illuminate them, and should the magnification be considerable we must have lots of light, so must put another lens, called a condenser, under the stage to concentrate the light. Such an outfit constitutes what is known as a compound miscroscope. To be sure, there are refinements which can be obtained on high-class instruments, such as coarse and fine adjustments for focussing, a turret, or nosepiece, for holding several objectives of different powers, means for rotating the stage and mechanically moving the object, diaphragms for controlling the light from the condenser and focussing it, together with many others necessary for critical high-power work, but the principle is the same for all.

THE FOOT OF THE HOUSEFLY
The microscope enlarges 135 times the foot that a moment ago was in the garbage.

As the purpose of the microscope is to magnify, it is not surprising that the first question asked by the novice generally is "How much does it magnify?" The idea seems to be that the more powerful a microscope is, the better it is. Such is not necessarily the case for most good instruments are arranged so that objectives and eyepieces of any power can be used interchangeably, therefore the range can be anything from five or ten diameters to a thousand or more. It all depends on the object under examination what magnification is best; in general this means the lowest power that will show the details we want to see.

Then there seems to be a hazy idea as to what magnification means, for one frequently sees statements,—especially in fake advertisements and newspaper items,—that a certain thing is magnified hundreds of thousands of times. The accepted method of expressing enlargement is in terms of diameters, that is, if an object one one-hundredths of an inch in diameter were magnified until it measured one inch across we would say it was magnified one hundred diameters. The area of the object would be increased as the square of the diameter; with a magnification of one hundred diameters it would therefore be one hundred multiplied by one hundred or ten thousand times. We must know whether diameter or area is meant and for this reason no trained microscopist ever implies any other term than diameter when expressing magnification.

Fortunately the optical principles of the microscope are

VANADIUM CRYSTALS TEN TIMES MAGNIFIED
"Like the ruins of some ancient temple of which not one stone is left standing on another."

such that the object may be viewed directly with the eye or the image may be projected into a camera and photographed. Pictures taken through a microscope are called photomicrographs. When viewing them one should always imagine he is looking into a microscope and seeing the object just as it appears there, except for color.

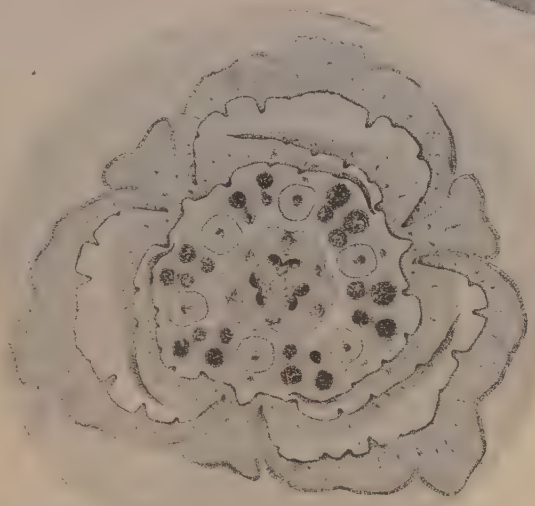
Let us assume that we have a suitable instrument and are ready to make use of it in our Nature study. First we will do a little experimenting on anything that comes to hand,—a handkerchief will do. With a low power, say about twenty times, and a bright light thrown down on our object, we take our first look.

"What, as big as that, and only magnified twenty times? Why that magnification ought to be enough for 'most anything! You say those flat-twisted fibers are *cotton* and I bought that handkerchief for linen! Now I can check up and know what I am getting." So the comment goes.

"Let's try something else; here's some sea sand from the bottom of the fish aquarium. Wonderful! White grains of quartz, black crystals of magnetite, beautiful red fragments of gem garnets. Can it be that all the sand on the seashore is as beautiful as this? What a pity we can't see things like that with our natural eyesight."

"How about this piece of rock in the curio cabinet incrusted with a drusy, brownish layer that is supposed to be an ore of vanadium? Oh! look, they are perfect little hexagonal crystals scattered about with an abandon that only requires a stretch of the imagination to transform them into the ruins of some ancient, miniature temple, of which not one stone is left standing on another. If this is a sample of what all inanimate Nature looks like we can understand what is meant by sermons in stones."

A TREMENDOUS MAGNIFICATION
This is a picture of the markings on the diatom *Amphipleura pellucida*, magnified 4400 diameters.

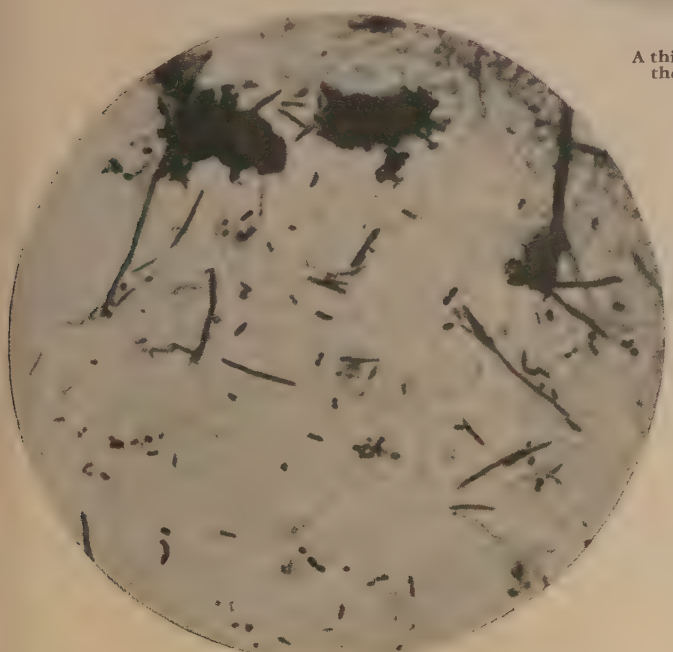


A LOOK AT A LILY BUD
A thin cross section of the bud shows the relation of all its parts. X10.

Surely there is some one around whose hobby is "bugs," impatiently waiting to try out the new toy on something of *real* interest. Presently we hear from him. "Here's a fly, let's give it the once over. Perhaps we can find out how he walks on the ceiling if we can get a good look at his feet." Off comes a leg and it is soon in place on the stage. Once again the magic glasses do not fail us. As drawn scimitars in the hands of an oriental chieftain, or—to be more modernly prosaic—like a pair of miniature ice tongs, the two claws stand conspicuously forth. It is easy to figure out how they are used. And between them are the two pads (pulvilli) evidently intended for walking on glass and other smooth surfaces where the claws are useless.

Then we see the hairs on the leg which serve as a comb for removing dirt from the wings. And just look at all that dirt sticking to the pads! No wonder the doctors tell us to "swat the fly" if they carry dirt around like that. Suppose that dirt was picked up in the garbage can and only a minute ago Mr. Fly was walking with his muddy feet right over our supper! We don't feel as hungry as we did a minute ago.

Now for a look at the tongue, or proboscis as it is called, of the fly, that we may understand another of its dirty habits. As this object cannot be satisfactorily ex-



BACTERIA FROM THE TEETH
The microscope has done great service in the field of medicine in the detection of germs. X1700.

amined until it is spread out and rendered transparent, we will have recourse to a mounted slide. Most conspicuous are the lobes, like liver pads, at the end of the tongue and in them can be seen the minute channels through which the food is sucked up. From their nature it is evident that a fly can eat only liquid food. But everyone knows that flies like cake and cheese and bread and meat, in fact everything we humans like. Then how do they eat these things? Let me whisper the answer and you can pass it on. The fly spits out a mass of saliva on the solid food which possesses the power of dissolving it, then after it has had time to act, sucks it up again through the tubes in the pads! Somebody innocently asks, "What if the fly only stays on the food long enough to spit on it and then it is scared away? Another thing to take the joy out of eating. But we must not blame the microscope because it reveals these facts to us.

Perhaps it is time to take up a more pleasant subject and at the same time give our botanically inclined friends an opportunity to see something in their line. Here is a prepared slide of a young lily bud, made by cutting a thin cross-section through it. Sepals, petals, stamens, anthers and ovary are thus shown in their exact relation to each other. We could spend a whole evening studying the histological details thus revealed but must save such study for another occasion; now there is only time for one short look. There are, however, some things to be noted in even a cursory glance. Beauty of form, symmetry of design (based on the eternal triangle), protection of the delicate germs of the new life, strength where most needed, and perfect harmony of function in every part, all testify to the marvels of Nature even in a growing flower. We are reminded of the admonition of the Great Teacher, "Consider the lilies of the field, how they grow."

Perhaps most of all has the microscope demonstrated its value in the study of the tissues of the body in health and sickness, and in discovering to us the bacteria as the causative agent in many diseases. Not all germs are dangerous, some are even of great benefit to us, others again are the cause of minor ills. Among these last are those that insist on taking up their abode in our mouths and sooner or later causing us to make a date with the dentist. Suppose we take a little scraping from a tooth and smear it on a slide. Then when it is properly fixed and stained (for the bacteria are colorless and could not otherwise be seen), we turn the highest power we have on them. Small indeed, but what diversity of form, round and elongated, crooked and straight, small and very small, all are present in countless confusion. And to think that each one of them has but one purpose in life, a living at your expense and mine! And still worse is the thought that they can double their number every twenty or thirty minutes! There seems to be a good reason for the toothbrush and paste after all.

And so we might go on. Everything in Nature,—animal, vegetable, mineral,—is a potential problem for the microscope and can be studied to advantage. The many things we do not yet know far outweigh the few we do, and the microscope is one of the agencies which will in the future unlock many fast closed doors. To speed that time we can only hope that every student and lover of Nature will become enthused with a desire to possess a microscope and contribute something toward spanning the gap still separating us from the unknown.

PHOTOGRAPH CORNELIA CLARKE

GOSSIPING IN THE BACK YARD

Crickets appear to do most of their exchanges of confidences with their feelers and one wonders what the subject of conversation is.

A brief article about Bubo in our August, 1926, issue prompted Mr. Bell to prepare this. We are glad it did, both for Bubo's sake and ours.

BUBO, JUNIOR, WEIGHS IN
On his fourth weekly birthday he tips the scales at two pounds, tree-side.

WHEN BUBO NESTS

By Hugh Stevens Bell

(Photographs by the Author.)

Courtesy of Cleveland Museum of Natural History.

Hugh Stevens Bell, who lives in Willoughby, Ohio, is a young naturalist-writer with much already achieved and much ahead in his work.

IN ALL the world I seriously doubt if there is a more persecuted family of birds than the owls. They are in much the same position as a fat man, whom nobody loves, if we are to take a common saying at its face value.

Of course there are many reasons why people in general do not like owls. Their faces frequently look sufficiently human to make them uncanny. Their voices, often weird, strengthen this impression, and their established custom of being about when all good birds should be "in bed" is one more count against them.

Fortunately there are many people who refuse to be biased by such silly considerations as these, but they condemn owls none the less. Their verdict is rendered on the ground that owls prey upon song birds, game birds, and poultry — charges which are more or less justified.

Then there is a third group made up of persons really interested in birds and their value to mankind. These rare individuals have much praise for the barn owl, some for the barred owl, perhaps a little for the screech owl—possibly none at all — and upon the head of the great horned owl they heap up most of the sins of the owl tribe in eastern North America.

But there is yet a fourth group made up of those exceedingly rare individuals who really love owls, and champion their cause regardless of species. To this tiny clan the author belongs, so if you do not wish to have the virtues of owls extolled in your presence, pass on to more satisfactory matter.

A great many hunters pride themselves on the number of hawks and owls they have slaughtered. How often one sees young hunters carrying home these great birds in triumph; trophies of the hunt, marks of their prowess! It never seems to occur to them that there is little cause for rejoicing over hitting a barn door—yet hawks and owls are the "barn doors" of the bird world in much of eastern United States, and great is the rejoicing of the youth who shoots so accurately that they fall before him.

I never appreciated the remarkable beauty of caterpillars until I raised a few hundred of them from the eggs, watched them cast their skins, grieved as they died of "dry leaf colic," rejoiced as they spun cocoons or hung themselves up to pupate, and gloried in the

OWLET INTIMIDATING AN ELEVATOR
The clothesline-gunnysack lift is about to whisk it up to its nest in the slippery elm.

WATCHING THE AUTHOR WIGGLE HIS FINGER
Very serious business, as you will gather by the expression on his face.

beauty of the perfect moth or butterfly. "Familiarity breeds contempt" sometimes, but not always.

It is just as true that I never appreciated *Bubo virginianus*—the great horned owl—until I watched him grow from an egg to a magnificent bird of prey. Each year my eagerness for the nesting season to open becomes greater, each year my respect for Bubo increases, for each year I find myself fighting for his life from firmer ground.

So far as I have been able to discover, Bubo actually does open the nesting season in northeastern North America. In the woodlands about my home in northern Ohio, Bubo occasionally finishes laying in the first week of February, and even our severest winters are rarely able to delay the beginning of incubation until the first week of March. In my experience, there is no local bird, not even the bald eagle, which has the courage to lay so early in the season.

To be sure the traditions of the eagles require the building of a new or the repairing of the old nest, a fact which delays them slightly, but Bubo is not delayed by anything of the sort. "Tiger among birds" he has been called, but "Pirate among birds" would be a more honest description at nesting time. Mrs. Bubo, I believe, looks over the old hawk and crow nests of the region and moves into the one which suits her fancy without further ado. Occasionally she nests in a hollow tree, but she requires a cavity about the size of a beer keg, and these are not common. Once she has found a cavity of this kind, however, nothing short of death keeps her from returning to it to rear her family in the same home each year.

During the day Bubo spends much time hiding in hemlock trees, where he sleeps close to the trunk, fairly safe from hunters and crows. But when Bubos nest there seems to be no partiality for hemlocks, for I have found their nests in sugar maples, beeches, and elms, usually at heights between fifty and sixty feet. Nests in hemlocks may be as low as twenty-five feet.

Buffy bits of down on the branches of the nesting tree often serve as identification marks. Owls' feathers are tipped with down, making their absolutely noiseless flight possible. These down tips are torn off by twigs as the owls enter or leave the tree, and their presence in any reasonable number is an almost unfailing sign that the nest is occupied.

The eggs are about the size of an average hen's egg, white, and considerably rounded. They weigh slightly more than two ounces. Usually there are two, rarely one, occasionally three. As incubation progresses the eggs become more and more soiled, and before they hatch have become leaden gray.

There are those who would have us believe that Mrs. Bubo lays her eggs about a week apart, and then begins incubation. I cannot agree with them, since laying in our region begins when zero weather is not uncommon, forcing incubation to begin immediately to prevent freezing. Furthermore I have twice had the privilege of seeing the eggs hatch, and in each case they hatched on consecutive days. This combination of observations convinces me that the eggs are laid on consecutive days. On another occasion I found a clean egg in the nest one day, and another the following morning. This, of course, is not absolute proof, since I did not visit the nest previous to my finding the first egg, but a clean egg in Bubo's nest is a very fresh one.

Unfortunately I have never succeeded in checking the incubation period, but the generally accepted time of twenty-eight to thirty days is probably correct.

Bubo's babies lack much from an æsthetic point of view when they are newly hatched, but the same may be said of the vast majority of birds. They are completely covered with buffy down, much like a baby chick. Their

BUBO BREATHES THROUGH HIS MOUTH WHEN AFRAID
These little fellows are six weeks old and will have made their maiden flights in another week.

heads and beaks are disproportionately large, and so heavy that for ten days or so the little ones slide their heads on their beaks, and seem wholly unable to lift them when they move from place to place in the nest.

From the time the first egg hatches until the young are about to leave the nest, an abundant supply of food is kept before them, under them, or behind them, or in all places at the same time. I have found four and one-half pounds of rats, rabbits, pigeons, mouse and weasel in a nest occupied by babies which, together weighed a scant three pounds.

Such lavish provision is not common, and indicates perfect hunting conditions as well as an abundance of game. During rainy weather there occasionally come times when there is no food in the nest. This is largely due to the fact, I believe, that the owls hunt far more with their ears than with their eyes, and the rain drowns out many of the little sounds which are audible when there is no patter of drops upon the leaves. Rainy nights mean lowered visibility, and decreased activity on the part of both hunters and hunted.

But the importance of an owl's ears as adjuncts to hunting cannot be too strongly emphasized. Someone, I do not recall who, has said that an owl can hear a flea walking up a chipmunk a hundred yards away. He was, of course, a picturesque liar, but he doubtless understood the importance of an owl's ears.

There are people who seem to believe that an owl is blind in the daytime, but can see clearly at night, no matter how dark it may be. Experience leads me to conclude that owls can see perfectly well on the brightest days. Although at night they see many times better than humans, I doubt not there are inky nights when they can not see at all.

But we have wandered far from Bubo's babies. The first food brought to the nest has been, in my experience, mice. Always they are headless. Before the second egg hatches there may be three or four of them in readiness for the appetites which are sure to develop.

The babies are soon introduced to rats, and by the time they are a week old, just as their primaries are beginning to become evident, they are treated to a meal of rabbit. For the rest of their lives, in our region, rats and rabbits are staples, while mice, pigeons, robins, sapsuckers, weasels, skunks, young raccoons, and an occasional grouse or quail are brought in as delicacies.

THE HEROINE HERSELF
Truly a noble profile. The eyes and lashes of Bubo are remarkably beautiful.

I suppose a summary of the food brought to a nest during one season of six and a half weeks will give some idea of the value of these birds in a community where domesticated fowls are adequately housed. Here it is: mice, 3; Norway rats, 7; rabbits, 7; short-tailed weasel, 1; pigeons, 2; robin, 1; yellow-bellied sapsucker, 1; and flicker, 1. That other food was brought to the nest there is no doubt, for observations were made at intervals of one week.

GROCERIES FROM BUBO'S BABIES' BANQUET TABLE
The female short-tailed weasel is now a mounted specimen in the Cleveland Museum of Natural History.

Skunks are so commonly caught by Bubo, that the summary I have given seems incomplete without one. I have little reason to doubt that more than one kitten, and possibly a few adult cats have found their way to the dining table of young Bubos, but as yet my evidence in this direction is not conclusive. Squirrels appear rather frequently in some nests, and not at all in others.

The fact that rabbits, squirrels and partridges do take their place on Bubo's menu has turned sportsmen against him, despite the fact that on that same menu are such cutthroats as weasels. Until the spring of 1926 I never found any trace of a partridge in Bubo's nest, and then on only two occasions. That, of course, is damning evidence, but what about the four times I have found three Norway rats on Bubo's festal board ? Or the dozen or more times that two of these rodents have formed the *piece de resistance?*

Upon such food as this the little Bubos

make an average gain of an ounce each day during the first month of their careers. After that they seem to put most of their food into feathers which weigh very little.

They improve in attractiveness steadily, and by the time they are four weeks old they have become the most attractive babies the birds of northern United States produce. They are full of inherited hostility, which is largely bluff. They hiss, snap their beaks loudly, and spread their wings in such a way as to make them look huge, and, they seem to believe, terrifying. As a matter of fact they only add to their beauty.

When in distress, or so thoroughly frightened that the help of the parents is desired, the owlets make a sound which fairly closely resembles the noise made by a month-old chicken in trouble. It rarely fails to bring the parents, even from distances of more than a quarter of a mile.

Several years ago one of the great American magazines published an article setting forth the ferocity of Bubo at the nesting season. It was shown that Bubo is not afraid to attack a man, and the results of such an onslaught were described fully enough to make it apparent that other things are more to be desired. Bubo is probably the only large native bird in North America which will actually attack and damage a man.

I must admit that my first visits to Bubo's nest were made with no small degree of doubt, and to this day the finding of a new nest always carries with it a considerable degree of nervous excitement. I have never yet been actually attacked, although I have been threatened more than a score of times. Yet I am always a little fearful that each new nest I find may be the property of a Bubo who "doesn't know the use of fear."

Mr. and Mrs. Bubo always look large, but when one flies at you as you stand by the nest, you realize immediately that the great auk himself was nothing more than a humming bird. And when Mrs. Bubo perches on a limb not five feet away, and clicks her beak as vigorously as a trap drummer making horses gallop over a bridge, your hair has a way of trying to stand on end, your stomach feels like it does when the elevator starts upward at express speed, and your knees are as weak as water. Then when she demands "Whooo Whooo?", in a bass voice, you begin to wish for many things which you have not, even to wish you were somebody else, or somewhere else. And certainly not without reason, for there are authentic records of Bubo's attempts to snatch certain individuals bald-headed.

So far my encounters with the Bubos have resulted in no more serious injuries than teeth marks in my heart, but then, another season will soon be here, and one never knows!

Bubo is no coward. I have seen him stand his ground against three dozen swearing crows. I have seen him pluck breast feathers from a pair of insolent red-shouldered hawks. I have found the cutthroat weasel dead in his nest. I have seen his eyes burn with hatred as I took his babies from the nest to photograph them. Courageous, daring, skillful, beneficial to mankind, I admire him above all other birds of our forests, and recommend him as deserving of your admiration and protection.

Chinese Geese Policemen

By Ethel Mason

ONE of the interesting customs of the West Indies is the use of Chinese geese as feathered policemen around the premises, according to an ornithologist of the Smithsonian Institution. They not only inform the immediate family of the approach of enemies, but also the entire neighborhood as their raucous cry is by all odds the most irritating noise that may assault the ear outside of a boiler factory. It is also as persistent as a foghorn in thick weather off the Banks, as once started the Chinese goose is reluctant to turn off the alarm, since his feeling in the matter is, "Let no guilty man escape."

FEATHERED COPS
These three Big Bens can be relied upon to sound the alarm.

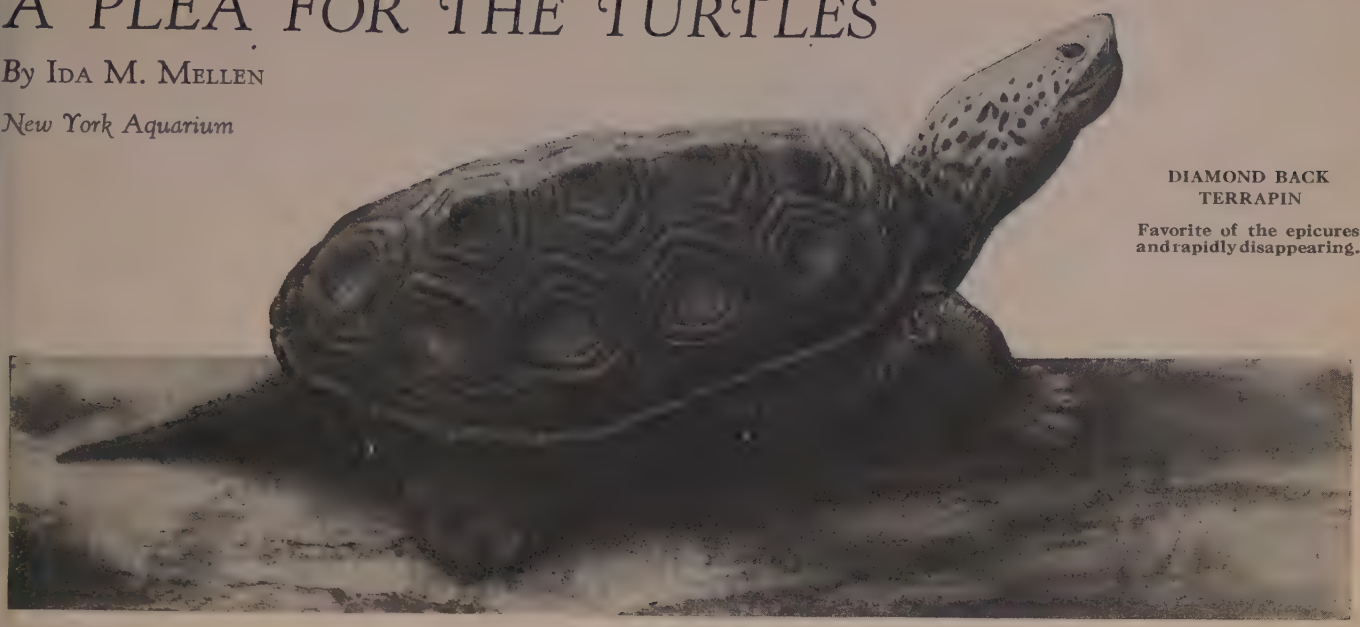
Having been trained for generations to act as watchmen, this goose requires no special instructions in order to go into action, as was recently discovered by the official guardian of the rare wild fowl at the National Zoo in Washington, D. C. A trio of these Chinese geese had been installed at the barn where a number of rare eggs were being incubated. After the first night or so spent in getting acquainted, the night watchman learned that if a chicken as much as raised a wing, the Chinese geese were on the *qui vive*. As for a step on the path, the place was in an uproar from the self-appointed guards with protesting squawks that could be heard all over the park.

No mere burglar could have escaped their shrill cries as Chinese geese have their traditions and take themselves very seriously indeed, as is the police habit.

A PLEA FOR THE TURTLES

By Ida M. Mellen

New York Aquarium



DIAMOND BACK TERRAPIN

Favorite of the epicures and rapidly disappearing.

"WILL you give us a radio talk on turtles and tortoises?" I was asked. Consenting, I thought that a visit to the turtle market might produce some news items. It did, gruesome ones; facts that are not nice in the telling but which are facts that we must face all the same. The only information obtained that could be used in broadcasting was that green turtles, formerly so common in the Atlantic that they are generally referred to as Atlantic green turtles, are rarely seen now except in the breeding season in May and June, and have become so scarce from over-fishing that the specimens now taken for our northern markets come from the Caribbean Sea! They are not plentiful there.

The plain question is:—Should we exterminate the turtle because some people fancy turtle soup and turtle eggs as articles of food? Instead of waiting until the last turtle is gone from sea and lake and pond and inlet and then bemoaning the vastness of human stupidity, as we have done in the case of so many other defenseless animals now wholly extinct, perhaps we might exercise a little intelligent forethought and prohibit their extermination.

No charge of cruelty can be brought against the owners of the turtle markets. They serve the hotels, who serve the public. The blame rests solely upon the people who demand to be fed upon turtle soup and turtle eggs.

At the turtle market there was a large tank of diamond back terrapins. These famous terrapins have handsomely sculptured shells, but that does not save them from human voraciousness. It takes four of them to make a pound of flesh, and a pound is worth $25. They swam about the tank, little suspecting the cruel fate that awaited them.

"How do people kill them?" I asked.

"Generally by plunging into boiling water; sometimes by chopping off their heads," was the reply.

"Have you no sliders?"

"Not just now. We handle them in season, but as a rule people cut out the eggs and eat no other part."

Slider and cooter are terms applied to terrapins other than diamond backs—snappers and other freshwater species, mostly from the southern states.

"And do you not trade in sea turtles?"

"Yes, would you like to see them?"

"Assuredly."

We went down into

TERRAPIN GETS RARE AS EPICURES LAMENT

By the Associated Press

BALTIMORE—Once so plentiful that Maryland legislators saw fit to limit its use as food, the Chesapeake diamond back terrapin, delight of epicures, today is so scarce that state conservation officials face the problem of protecting the "turpin" itself from extinction in its wild state.

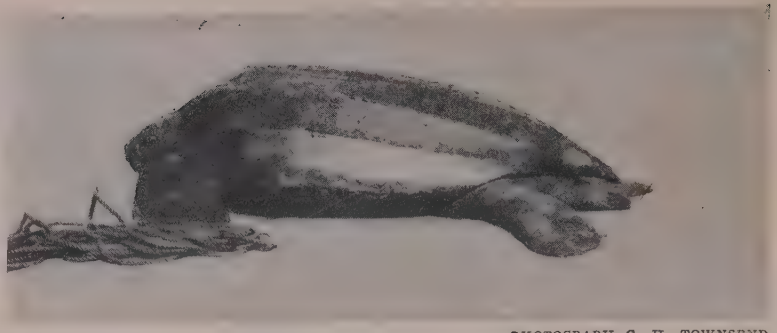
This newspaper dispatch is significant, and Miss Mellen's article is increasingly important in the light of what it sets forth. No further comment seems necessary. Miss Mellen's article is a startling document.

PHOTOGRAPH ELWIN R. SANBORN

GALAPAGOS ISLAND TORTOISE

It is possible that none of these exists today save in the confines of Zoological Parks

the cellar. It was a large, dry cellar with cement floor. Scattered over the floor were a dozen or more Atlantic green turtles lying on their backs. Sea turtles cannot right themselves if "turned turtle." One on scales at my feet weighed nearly 200 pounds. Their average value is $50 and the shell and flesh are both used in making turtle soup. Most of them had bulging, sightless eyes and were pushing themselves around in a circle and puffing. They had been there for two days awaiting a purchaser—and the guillotine.



PHOTOGRAPH C. H. TOWNSEND

THE LUTH OR LEATHERBACK
Much sought for food a century ago and also largely killed for its oil, it is now all but extinct.

"Do you put out their eyes?"

"No, they knock out their own eyes," said the owner of the place. "That question was threshed out in the courts some time ago and putting out their eyes was prohibited."

The question also came up in the courts some years ago as to whether these animals should be laid on their backs on board the boats conveying them to northern ports, and testimony was adduced to the effect that if not placed in that position, they die because of the pressure of the heavy carapace upon the lungs.

Just why they die on board ship or upon a wooden floor if placed right side up, is a problem. Dr. Alexander Wetmore of the Smithsonian Institution in Washington, states that these animals habitually crawl out on the beaches of uninhabited islands to bask and sleep, away from the sharks which are their worst enemies next to man. These turtles are killed by cutting off their heads, and they bleed to death in twenty minutes.

The hideous cruelty practiced in the Orient upon the hawksbill turtle, whose shell was once used so extensively for combs and other ornaments, has been largely ended by the discovery of horn and other substitutes for shell. The living animal is placed over fire and the plates slowly burned off. Then in its agony it is put back into the sea in the belief that the plates will grow again and it may be put through the same torture on a future occasion—but the shell never grows hard again as it was before. So much tortoise shell once was taken that the woodwork of rooms, beds and other furniture, were encased in it.

Sea turtles are taken by harpooning and, as they lay their eggs in tropical sands, the females often are captured when ashore. They are overturnd on the beaches and being unable to right themselves are at the mercy of their captors. Many a huge turtle, turned upon its back by some man who intended to return later and carry it away, has not been privileged to die in twenty minutes, but has dragged out suffering days of hunger and thirst and finally succumbed to starvation—because the man failed to come back.

The largest of the sea turtles is the luth, also called harp turtle and lyre, because of the shape of its shell. In the United States we call it more commonly the leatherback because it has a leathery jacket with blubber beneath instead of the hard shell characteristic of sea turtles. A hundred years ago it was used for food and has also been much persecuted for its oil. To-day it is so seldom seen that when one is captured, it is generally put on exhibition and admission charged to see it, while the strangest tales imaginable are hatched up concerning it.

PHOTOGRAPH ELWIN R. SANBORN

ATLANTIC GREEN AND HAWKSBILL TURTLES
Both of these turtles are persecuted and killed and are almost at the very point of extinction.

One printed advertisement of a specimen on view on the California coast some six or eight years ago stated that it was an animal the like of which never before was viewed by human eyes, yet the specimen was five thousand years old according to competent authority!

A cast of one of these leatherbacks may be seen in the New York Aquarium suspended from the ceiling over the sea turtle pool. How long they live is not known, but probably not over one hundred years.

Diamond back terrapins are so scarce that there are farms engaged in breeding them in southern states, and the Atlantic green and other sea turtles will soon be no more if we do not bestir ourselves in their behalf.

The giant turtles of the Galapagos Islands, on whose backs a man could ride, are nearly if not wholly extinct. They were the prey of whalers and other seafarers for generations, and once were so numerous that a French writer of the eighteenth century stated that three thousand of them might be seen at a time in one flock and one might travel one hundred paces on their backs. It took six or eight men to lift one of them, for they weigh on the average four hundred fifty pounds, though some, of which only the record remains, weighed more than twice that much. It is not impossible that the few specimens on view in zoological parks are all that remain of these inoffensive and wonderful creatures.

The enemies of young turtles are so multitudinous that if man were to keep his hands off them, they never would overstock the waters of the earth, either fresh or salt. The least that animal lovers can do would be to check immediately the use of turtles as food. There are plenty of other meat substances, without the turtles.

How The Worm Gets Into The Chestnut

By Bessie L. Putnam

IF you have ever seen chestnuts as they grow you must have wondered how the white worm which sometimes infests them ever gained an entrance to the nut castle. Never was any nut any more completely protected. True, the mischievous squirrel sometimes cuts off the half-grown burs, but he well earns his dinner, for even in the immature stage the spiny covering must be managed with caution. Our photographer has cut away a part of the outer covering, showing what a mass of spines it presents to the intruder. Yet within is the softest velvet cushion, on which the nuts rest like highly polished jewels in an exquisite case.

Mounted on the top of the bur and seemingly as much at ease as though resting on the cushion within, is the little pest which works its way into the treasures before they are ripe. It is one of the snout beetles, a name readily suggested because the head is extended into an organ considerably longer than the body. When any unusual form is seen in either plant or animal life we may always be sure that it is specially adapted to some purpose. In this instance the long snout is used as an auger to bore through the outer covering into the nut itself. Then the weevil places an egg in the hole, tamps it down with this same handy tool, and the mischief is done. The egg duly hatches into the well-known chestnut worm, which thrives and grows fat on the food supplied by the nut.

PHOTOGRAPH KEYSTONE VIEW

SNOUT BEETLE AT WORK ON A CHESTNUT
With its competent boring apparatus it penetrates the spiny covering and lays a devastating egg within.

Besides the one here pictured, the larger chestnut weevil *(Balaninus proboscideus)*, a smaller species also attacks the chestnut, and is particularly destructive.

HINTS and HELPS for HOME and GARDEN

February

If the house fern is beginning to look dry and yellow, take it out into the pantry and set it in a tub of water for an hour or two, sprinkling its fronds freely. Cut out the dead and dying fronds to make room for new ones, and give it nourishment by applying a handful of dried ox blood at intervals of two or three months during the winter. Do not overfeed your house plants. Too much fertilizer has somewhat the effect on the plant as too much rich food has on the human being.

Are your palms spotted with scales? If so, wash the fronds with whale oil soap. At the same time sponge the leaves of all house plants to remove accumulated dust and help them to breathe. Indoor plants need more moisture in the air than is supplied by the ordinary heated house. To make up for this lack, spray the leaves with water every bright day, and place a pan of water near the radiator or register that the evaporation may make the room healthier for both plant and man. In watering do not make the mistake of merely sprinkling the soil. Water thoroughly until the earth is soaked to the very bottom and the water running out, then leave it alone until the top soil is dried out.

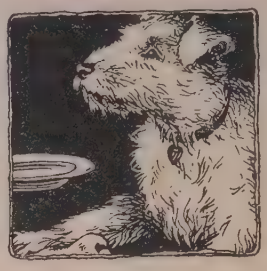
Plants in pots need more water than those in boxes, as the porous pot gives more opportunity for evaporation. This is an advantage as it allows fresh air to circulate around the roots, and freshen the soil. All plants require some direct sunlight, but while geraniums and the like thrive in a bright sunny window, ferns and palms prefer a shadier location with only a little sunlight. Too hot a house is unhealthy for plants but a sudden change of temperature is worst of all. Remember that the plants cannot retire under warm bedclothes at night when the house is allowed to cool off suddenly.

After a plant has bloomed well for some time, it needs a rest. Put it in a dark, cool dry place and decrease the amount of watering. Soon it will put forth new green shoots, after which it should be watered thoroughly again, repotted, and brought back to the sunlight. After it has started to grow again, a little fertilizer will help.

A piece of lettuce or apple will be appreciated by the canary once or twice a week.

Never feed the goldfish the prepared wafer food so often sold. They do not thrive on it. Give them rather the various powdered foods. A little oatmeal, salted as it comes to the table, is a treat, and ground up puppy biscuit is also good. Scrambled egg is good once in a while as it has a slightly laxative effect, and ordinary angle worms are splendid. Variety is generally desirable.

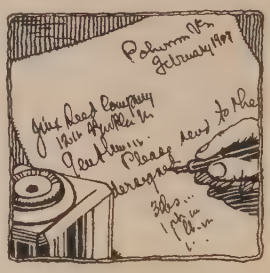
Table scraps form the best food for the dog. Do not feed him either potato or chicken bones.



It is good now to bring in the last of the bulbs which were sunk in the ground in pots. By the time they are through blooming it will be time for the first spring flowers outside. Do not bring the pots all at once into a warm room, but keep them in the pantry or similar cool place for a few days so as to accustom them gradually to the change.

It is time to order seeds for the garden. If you kept a record last year you may know what quantity of seeds to buy. If not, or if you are gardening for the first time, perhaps the following table will be helpful:

Beans—
Bush String—1 lb. to 50 feet of row.
Bush Lima—1 qt. to 100 feet.
Pole Lima—1 qt. or 2 lb. to 100 hills.
Pole String—1 qt. or 2 lb. to 150 hills.
Beets—1 oz. to 50 feet.
Carrots—1 oz. to 125 feet.



Corn—½ qt. or 1 lb. to 100 hills.
Lettuce—1 oz. to 3000 plants—2 pkts. usually sufficient.
Onions—1 oz. to 150 feet—onion sets are often considered better for economy of space.
Parsley—1 oz. to 150 feet—1 pkt. usually sufficient.
Parsnips—1 oz. to 175 feet.
Peas—1 qt. or 2 lbs. to 100 feet.
Radish—½ oz. to 50 feet.
Spinach—1 oz. to 100 feet.
Squash—1 oz. to 50 hills—bush varieties.
Tomato—1 oz. to 1500 plants—2 pkts. sufficient.
Turnip—1 oz. to 150 feet.

One of our readers has inquired how much seed would be required to furnish vegetables for the table of a family of five. The answer to such a question depends largely upon the skill of the gardener and his persistence in cultivating and weeding. Climate, rainfall, and soil conditions are also fundamental factors. However, the following table was contributed by a reader who claims that it represents a good average of conditions.

3 lbs. or 1½ qts. string beans.
1 pt. or 1 lb. of bush limas.
1 lb. or 1 pt. pole beans.
1 oz. beets.
2 oz. carrots.
2 lbs. or 1 qt. corn.
2 pkts. lettuce.
1 oz. onions.
2 pkts. parsley.
4 qts. or 8 lbs. peas.
1 pkt. radish.
3 oz. spinach.
½ oz. squash.
2 pkts. tomato.
1 pkt. turnip.

When you first step outside to greet a world of dazzling whiteness the light dazzles your eyes. By and by they apparently become accustomed to it. The reason lies in the narrowing of the pupils. Remember this when photographing snow scenes, and slightly close the diaphragm on the lens or eye of your camera. This will prevent many fogged pictures.

MUSEUM MAGIC BUILDS THE BEAVER'S HOME
A group at the Kent Scientific Museum, Grand Rapids, prepared and background painted by the author.

The Tactics of a Taxidermist

By EDWARD ALLEN HYER

Preparator, Kent Scientific Museum

"CRASH! Bump—bump—bump. Crash!"

The thick underbrush of beech saplings swayed uneasily. From the matted foliage where some heavy object had crushed a path, one sturdy beechling jerked itself erect. A sudden rifle shot; the whine of a bullet; a dull fall; thrashing of leaves—silence.

The branches parted, thrust aside by eager hands, and a voice, half-elated, half-regretful, exclaimed:

"Whew! He's a big one. That fixes the group. But I sure did hate to kill him!"

The big black bear said nothing; but the steel-jawed trap which mouthed his left hind leg, the heavy log "toggle" at the end of a steel-linked chain, and the jagged paths torn through the woods, were eloquent of the mighty struggle he had made for his freedom.

The man who had just fired the silencing bullet and who now busied himself with preparations for skinning his "kill," was a strangely clad creature. Although the summer day was tangibly warm and growing warmer, he was wrapped in thick clothing; his hands were encased in heavy gloves; and his hat, head, and shoulders were swathed in a bright green veil, the ends of which were tucked into the front of his shirt. But an inch of bare skin was visible for it was mosquito time in the north and the hum of mosquitoes, black flies, and other insects surged through the woods. But this was all part of the game, for the man was a museum preparator, who was often called upon to officiate in strange places at the weddings of science and art, in the hope that the offspring of the union would be that extremely valuable adjunct to modern education—a museum habitat group.

"Well, old timer, your troubles are over but mine have just begun," observed the museum man, skillfully setting to work. And in that one sentence he summed up the philosophy of the modern taxidermist; the philosophy which makes him the most careful of all hunters. Not for him the thrill of the sportsman who can kill to the limit of the legal "bag." Whenever a museum man makes a "kill" he is storing up just so much more work for himself because he has to "prepare" his specimen.

GETTING THE FACTS ON THE SPOT
The artist painting the background in sketch form to be used for the coyote group.

Nowadays this is a painstaking and somewhat complicated process, but interesting withal. Let us put aside any preconceived notions we may have of the

THE START OF THE BEAR
This is the armature for the clay model with the leg bones and skull in place.

old-time "bird and animal carpenter," and see what penalty a museum taxidermist pays for pulling his trigger.

Behold him there in the midst of a maddening swarm of insects, skinning his animal. When the skin is off, salted, and rolled up at one side, he must tackle the carcass to take accurate measurements which he records carefully in his notebook. Often he must also extract the skeleton of the animal, which he will need in modeling his clay form. And remember that he must go through this process for every animal in the group.

Since he is preparing a *habitat* group, not only the animals but also their environment must be shown. So out comes his camera, and photographs of the locality are made for reference later on. Plants are collected—some to be used as models for plaster moulds, some to be pressed, dried and colored for use in the exhibit. If the taxidermist is also a painter he seeks a favorable location and paints a field sketch for the background of the group.

Follow him back to town. There while the skins are being tanned, he busies himself with making a miniature model of the group. Days, even weeks, are spent on the model. No effort is grudged, no pains are spared, for the finished exhibit will stand or fall by the merit of this working plan. After a dozen experiments the preparator determines upon the most desirable position for each animal. From the measurements taken in the field and the bones which he retrieved, he sets up a form for the clay model. This is the start of a lot of work.

The days are past when he would wrap a bale of hay around a clumsy wooden frame. He has become a sculptor; he models the anatomy of his beasts. The series of pictures herewith tells, better than words, the steps of procedure in making a modern "manikin" on which the tanned skin may be durably mounted. Often months are spent in this modeling, each muscle and sinew is reproduced. The animal must seem alive when it is completed.

Meanwhile like an obligato to the main theme of animal sculpture, foliage and accessories for the group are made. Thousands of leaves and flowers of wax or celluloid are prepared in plaster moulds; while in the exhibition hall a case is being built for the group. Soon the artist will transfer his background sketch (enlarged several hundred times) to its curved, smoothly plastered walls and domed ceiling. While the painting proceeds, a foreground of wood, wire, and plaster is built in the case. This is in keeping with the selected habitat—and when the animals are mounted and the leaves assembled into plants, branches or trees, and are set up in the group, the background must be connected with the foreground in such a manner that, ideally, the eye cannot detect where the one begins and the other ends.

When the illusion of live animals in real surroundings has been produced, the case will be closed with a plate glass window, through which it may be viewed *ad infinitum* by an admiring public. But the taxidermist will

THE CLAY MODEL COMPLETED
This base is laid over the armature shown above and is ready for the next step.

probably be already begging for a trip to Africa or Tibet or Florida in search of material for another group.

Taxidermy had its start in the commercial field as a method of preserving trophies of the chase. But some twenty years ago the late Carl E. Akeley lifted taxidermy forever out of the realm of the commonplace and dignified it as a real art by freeing it of its previous limitations, and giving it ideals and technical processes of its own, which have opened up vast possibilities of its development for educational exhibition. The future of taxidermy lies in the museums where time and funds are available for experimentation, and where scientific accuracy can reinforce art.

A habitat or "natural environment" group is the highest expression of the taxidermist's skill. It is a striking way of teaching scientific truths about the life histories of birds and animals. In a zoo the visitor is aware that the animals are affected by his presence; they may stop their activities to look at him. But in a habitat group the opposite should be true. The visitor should feel that he is in no way influencing the action of the animals, but that he is seeing them as they live, unconscious of the presence of man.

The old style of taxidermy exhibited single animals mounted four-square on a wooden base, doing nothing, and totally unrelated to their surroundings. Modern taxidermy takes several animals, often a family—male, female, and young—and exhibits them in their natural surroundings, in life-like positions, engaged in some customary action which generally exemplifies the chief characteristic in the life history of the species. The scene is a unit; it is arresting; it arouses a desire for further knowledge of the life which it portrays; it is the visual summary of months of research work, and above all else, it is accurate. It can serve as an open reference book, not only for the zoologist but for the botanist, the geologist, the artist, the sportsman, the college man, the school child, and the general public. And if at rare intervals a slight error may creep into some minor detail of a group, invariably some specialist will detect it and point it out for correction.

THE BEAR IS FINISHED
Having a papier mache base, he is much lighter, but he has taken on life for the museum.

THE BEAR PROGRESSES
Here the skin of the bear is being put over a plaster mould made over clay.

Undoubtedly the present type of habitat exhibit, which consists of mounted specimens on an artificially natural foreground merging into a painted background, has already reached its highest perfection in some notable museum groups. But this method has its limitations. Future development must bring changes in the underlying principles of group construction to attain a more vivid illusion of atmosphere and space. No museum preparator has yet achieved his ideal group. To be successful a habitat group should have the artistic composition, the balance and harmony of a painting; but it must be restrained so that it does not pass beyond the realm of actuality. Its artistic effect must be based upon fundamental scientific truth.

What then are the desirable qualifications of a museum taxidermist or preparator—the man who makes

such groups. In large museums there are specialists in taxidermy as there are specialists in other fields—one man may mount only large mammals, another may prepare birds, a third may make accessories, and almost always a special artist must be secured to paint the background. But in small museums the preparator must combine many or all of these specialties. He must be an artist as well as an artisan; a scientist as well as a field collector. Not only must he be master of the technical processes of his profession but he must have the ability to develope the latent beauty in his material without sacrificing the authenticity of his subject. He must be a keen observer and able to interpret his observations in the terms of his profession. And if he is to succeed as a "large mammal" taxidermist, he must have the sculptor's vision. That is, in modeling large mammals, he must be able to visualize the position of his subject from every angle, as if he could revolve it before his eyes. Where a painter sees his material in two dimensions, the preparator or sculptor must see his in three dimensions.

COYOTE GROUP AT KENT MUSEUM
Mr. Hyer also did the taxidermy and setting and painted the background for this.

The psychological effect upon the preparator of his close study and observation of the actions and habits of animals is revealed in the manner in which he is able to interpret and predict the reactions of his fellow man. One preparator tells of a certain museum official who always talked more fluently with a sheet of paper in his hand—probably a wholly unconscious action upon his part. The preparator accordingly saw to it that whenever this official visited his studio to plan work, a piece of blank paper was casually resting on the desk. This saved a great deal of preliminary discussion.

A genuine tribute to the effectiveness of the habitat group method of exhibition was offered by an old lady who visited a museum recently and saw her first habitat group—a family of foxes quite absorbed in their own affairs. She watched them intently for a few minutes, then:

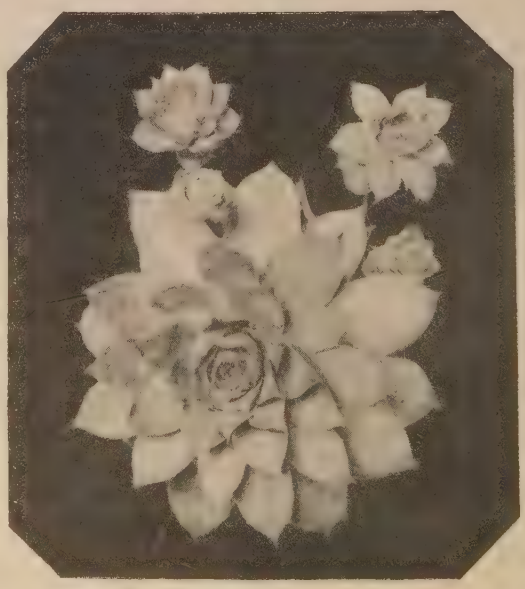
"Well, I declare," she exclaimed, "they don't notice us at all!" What higher praise of taxidermy tactics!

"Hen and Chickens"

By S. S. Dickey

GRANDMOTHER had many plants of peculiar charm in her garden, not a few of which have been forced off the stage by more popular varieties of today. The "hen and chickens" plant is one of these, descriptively named for the mother plant and the little ones that seem to hover around her. The plant is a member of the stonecrop family, resembling the dainty yellow houseleek and the orpine of the florist, but much larger in size.

The "hen and chickens" possesses stout roots which anchor the plant in the soil of pot or flower bed; and they are able to endure much drought without seemingly a sign of suffering. From these roots arise whorls of thick, stiff leaves, arranged in concentric circles and making one of the sightliest objects to be seen in any garden.



"HEN AND CHICKENS" PLANT
A favorite of grandmother's time, it was credited with warding off lightning.

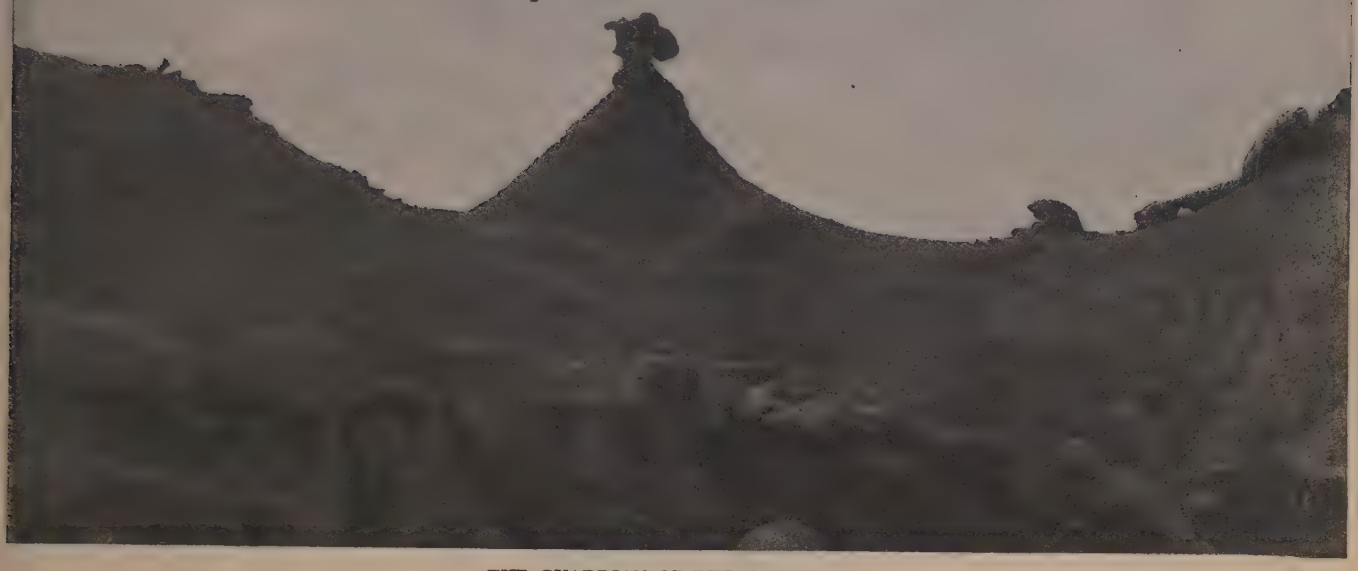
During the summer the flower stalks arise amid the numerous brood of leafy whorls and bear clusters of showy pink blossoms, fairly outdoing some of the modern posies the gardener so highly esteems.

Many a superstition surrounds the hen and chickens plant. It was supposed, in the old days, that this vegetable possessed a power to ward off lightning. That is one reason why it was planted all over the country by grandmothers of farm and village, who were prone to fly into hysterics at every approaching thunder storm.

Really the "hen and chickens" is not a native American plant. It flourished long ago in Europe and was brought over to adorn the old New England gardens.

The GOBLIN CITY

By Earl Douglass



THE GUARDIAN OF THE GOBLIN CITY
This is a natural bust on a natural pedestal located just east of where the White and Duchesne Rivers enter the Green River.

IN THE midst of the Rocky Mountain region is located a great mountain-encircled basin, perhaps richer in natural resources and in the splendor of scenic wonders and natural curiosities than any other section of the vast domain known as the intermountain region of the West. This territory is the Uinta Basin, embracing more than six thousand square miles of northeastern Utah, and extending into Colorado. The mountain barriers which hem it on all sides have discouraged railways, and the basin's scenic grandeur and resources are little known. Through the midst of this basin flows the White River, on its way from the fastnesses of the Rockies to the Green River. Playfully it has carved its channel through the rock formations of many geological ages, and in the last forty miles of its course it has, with its tributaries, eroded the various rocky formations of the ages of long ago into a natural gallery of fantastically graceful and striking forms.

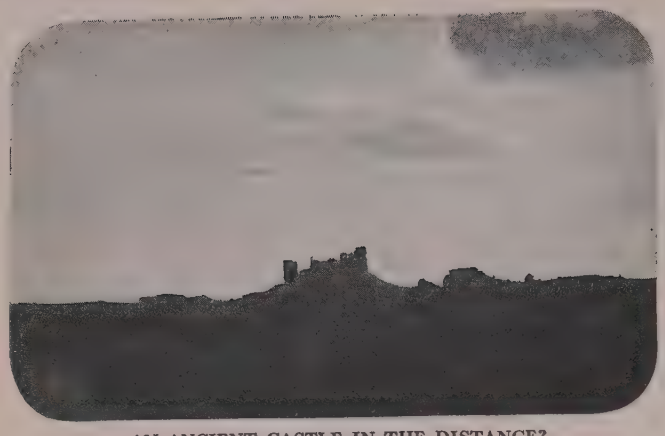
For many years geological work in the Uinta Basin gave me a vast amount of sport hunting the bones of prehistoric animals found nowhere else. But some of my most delightful days were spent with my camera, photographing the varied and unique features of this great domain.

One of the first United States Army expeditions to enter and traverse the Uinta Basin,—its route following approximately the course of the White River,—saw the fantastic rock formations carved by the elements during ages long past. The visitors named the territory near the lower course of the stream "The Goblin City," a very appropriate name, although it describes only a part of the carved forms. We would call the grotesque carvings creations of fancy if they did not really exist in forms so tangible that they may be, and are, photographed.

The author of this article and the photographs that illustrate it, is Professor of Paleontology and Geology at the University of Utah.

A PILLAR OF SANDSTONE
One can imagine weathered faces on this reminder of the vanished strata.

Nature has endowed these rock structures with colorings so delicate, and yet so distinctive, that every nuance is represented. Black and white photography cannot reproduce this effect. There are many and varied architectural forms, accurately carved by the elements. I have always thought, in fact, that they should be studied, for from them could be garnered valuable and original suggestions for beauty, impressiveness and ornamentation in architecture. Other forms are fantastic forms and, although not, perhaps, always



AN ANCIENT CASTLE IN THE DISTANCE?
No, just Nature erecting a striking figment in sandstone against the darkening horizon.

worthy of imitation, they appeal to our imagination.

Before he became blind, with what delight Milton would have wandered through these scenes! How the lonely and mentally isolated Dante would have revelled in this imagery in stone! Although some of the scenes appear to us to be the symbol of chaos, they are not chaotic. They were formed by the orderly forces which abide here and have been in the solid earth and have hovered in the desert air from the time of the "Ancient of Days." These same orderly forces are even now, in our day, continuing in their work of carving forms from the rocks.

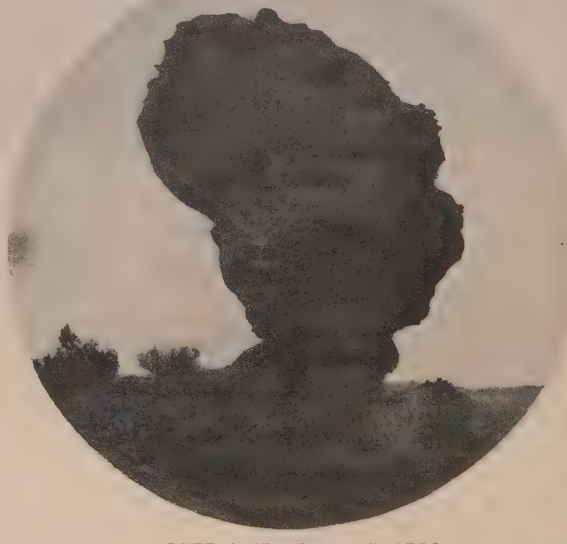
When one passes through these scenes it seems that over them breathes the atmosphere of the past. Is it that some of the scenes remind one of old and ruined cities? That the monuments suggest the dead, and that the carvings represent weathered forms chiselled by man in the days of ancient times?

However this may be, the ideas of a long past and the impression that the remains of the dead rest here is true. Here are found the remains of animals unknown in the flesh; animals that walk the earth no more. But that is another story.

The old Uinta stage line winding southward from Vernal to Watson, Utah, passed through a weird waste of gray and red hills called "badlands." The old term, "washed lands," used by some of the early Western explorers, is a better name for such barren tracts. These lands, like many similarly eroded deposits, contain the bones of turtles and mammals that lived in the olden days. Due to the comparatively rapid "washing," or eroding, and the scarcity of soil and vegetation, the bones are frequently exposed to view.

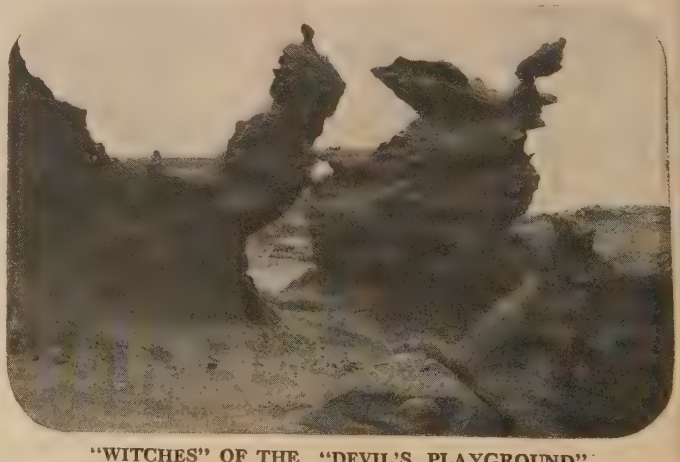
One day, while searching for such bones, I came, at evening, to a place where great masses of gray sandstone, which had been deposited in the softer clays, had been weathered into fantastic forms. It appeared as if some ancient artists, in sportive mood, had carved in stone the forms of their wildest fancies.

It was late in the afternoon; but, accompanied by a friend, I picked a trail and drove through the labyrinth of rounded badlands hills to this place. I had my camera, as this was purely a picture-hunting expedition, and a fascinating one. We approached from the southward over a nearly level sage-brush flat, a veritable oasis amid the barren hills. As we approached the fancy work in stone the scene became more and more impressive. The masses and groups of statuary were of soft gray sandstone, and for a background Nature had provided the bare rounded forms of badland hills. When near enough I took photographs of the entire scene with its background. Then I photographed nearer views of groups; and after this began the fascinating work of photographing detailed rock sculptures. Among the striking forms photographed and named were the Devil's Couch, the Devil's Pulpit, Madam Pompadour, the Lady of the Desert, the Baby in Stone, the Temples, and the Pagoda.



LIKE A CLOUD OF STORM
Large mass of rock left by erosion west of the Uinta railway stage road.

On returning from another fossil-hunting expedition I passed through a similar so-called "Devil's Playground," located about twenty miles to the southeast. Here I found remains of prehistoric mammals and suggestions of animals and man etched out of rocks by the elements, but there was no close resemblance between the fossil animals and the more modern life-suggesting forms. One of these freaks of Nature's handiwork very strongly suggests the bust of a man placed on a natural pedestal. As he sits there day and night looking over part of the badlands I have named him "The Guardian of the Goblin City." It was probably this place, more than any other, that suggested the designation of the Goblin City. It is a city that any Nature-lover would find interesting and the keys to it are wrought in the golden metal of romance and willingly awarded to all who come and seek them.



"WITCHES" OF THE "DEVIL'S PLAYGROUND"
Freaks found east of the Uinta railway stage road from Vernal to Watson, Utah.

HEPATICA HIDES BESIDE A WOODSY LOG
This is one of the earliest wild flowers, dainty in its woodland home and threatened with destruction.

Preserving the Wild Flowers

By P. L. Ricker,
President, National Wild Flower Preservation Society

DURING the last few years interest in the protection of many of our disappearing native plants has increased to a remarkable extent. Wild flower preservation is, at last, beginning to mean moderation in picking and cultivation from roots or, preferably, seeds of the rarer kinds. Aside from the leadership in the movement of the purely Nature organizations, civic bodies throughout the country are cooperating in an effort to preserve at least a part of the beauty of our native landscape. Many public and private sanctuaries for the protection and study of wild life are being established.

Fifteen states—California, Colorado, Connecticut, Delaware, Florida, Illinois, Maryland, Massachusetts, Minnesota, New York, Pennsylvania, Vermont, Virginia, Washington and Wisconsin—have passed laws for the protection of their native plants. In other states bills along similar lines have been introduced but thus far have failed to pass. Unfortunately such laws are difficult or impossible to enforce and they have had little effect on the situation. The effort spent to bring about their passage would have had far greater results had it been directed toward an educational campaign through the schools and newspapers. In the District of Columbia, without such laws, the picking of dogwood has been largely stopped by education.

The rapidly increasing number of newspaper editorials and cartoons on wild flower vandalism, with other articles, often based on circulars sent out from national headquarters of the Wild Flower Preservation Society every spring and fall are playing an important part in influencing public opinion. Teachers can get free literature and suggestions for class use. Those organizing Junior Wild Flower Preservation Chapters are supplied with membership buttons and outline drawings of flowers for the children to color in class work.

The planting of wild flower gardens is becoming very popular. When this is done from seed or from roots, and not at the expense of exterminating rare species from some other locality, it is to be encouraged. Few nurserymen supplying wild plants, however, are propagating any material in their nurseries or using care to leave sufficient plants to maintain a normal supply. For example, only one seedsman in southern California can supply even a fair variety of wild flower seeds, and these are rarely adapted for growth in northern and eastern states.

The idea has been long prevalent that plants with bulbous roots, such as Jack-in-the-pulpit, spring beauty and dog's-tooth violet, are safe from extermination. In most cases, however, these bulbs serve only as a food supply to enable the plants to make new growth in the spring, usually being absorbed in the process. The leaves are the essentials to storing up of food supply and the picking of them with the flowers spells the doom of the plant. They should be left where Nature planted them.

Colored pictures of flowers are in great demand both by children and adults. If they show the flowers in their natural surroundings, they have an added educational value in creating a desire to see, study and preserve the flowers in their homes. A series of twelve eastern wild flowers issued on post cards in colors about a year ago proved so popular that with very little effort one hundred and forty-four thousand were disposed of in six months and created considerable demand for a similar series from other parts of the country.

The American Nature Association is cooperating to extend the first series with the colored pictures herewith. These, and those to follow, will be available separately

Could many of our wild flowers tremble with fear there would be quaking of the earth in field and wood. Before them lies another season when they may be plucked up by the roots, gathered without regard for the future, and their numbers still further diminished. On the next two pages are printed pictures in color of six wild flowers from photographs taken by Mr. Brownell, Mr. Shoemaker and Mr. Crandall. The American Nature Association urges its members to become acquainted with these flowers through the pictures, to read Mr. Ricker's report of progress and to spread abroad the thought that the most beautiful wild flower is the one that is left where Nature meant it to grow.

SPRING BEAUTY—*Claytonia virginica*

DWARF CORNEL—*Cornus canadensis*

WILD GERANIUM—*Geranium maculatum*

WIND FLOWER—*Anemone quinquefolia*

RED-BUD—*Cercis canadensis*

YELLOW ADDER'S TONGUE—*Erythronium americanum*

on sheets and in sets of six separate cards. It is planned to include southern and western flowers.

While nearly five thousand very excellent habitat photographs of wild flowers are available for the series, there is a scarcity of good habitat photographs of either the common species or those in need of protection, from the South and West. Those having such photographs are urged to submit prints to the writer, in care of Nature Magazine, for consideration in the series.

THE SWAMP MAGNOLIA
This beautiful wild flower is rapidly being destroyed in many localities by draining and filling operations.

The series will not necessarily be confined to flowers in danger of extermination but will include the commoner and more popular attractive species that can be picked more or less freely, and which are of special interest to teachers for class use. All will be accompanied by notes on the distribution, habitat, lore, and economic uses, if any. Those selected for the first series and printed here in color are:

The Spring Beauty, *(Claytonia virginica),* is sometimes called May, or grass-flower, and is found from March to May in most deciduous open woods and fields from Nova Scotia to Saskatchewan and south to Georgia and Texas. There are about twenty species natives of North America ranging west to British Columbia and California and they belong to the Purslane family. The first part of the scientific name is in honor of John Clayton, an English botanist who settled in Virginia. The plant has a tuberous root about one-half inch in diameter and that is about four to six inches under ground. The flowers wilt and fall to pieces very quickly after picking. Some of the species extend into the Alpine meadows of the Rocky Mountains, and propagate from small bulblets in the axils of the stem leaves as well as by seed.

Dwarf Cornel, *(Cornus canadensis),* is also called bunch-berry and is found from May to July in low woods from Newfoundland to Alaska and south to New Jersey and California. Only one other similar dwarf species is found in North America, the other species all being shrubs or small trees. In the dwarf and two of the larger kinds the large white flower-like parts are only modified leaves for the purpose of attracting insects. The true flowers are the small greenish bodies at the center of the large white leafy bracts. The berries of the bunch-berry are sometimes eaten. They also furnish considerable food for birds.

Wild Geranium, *(Geranium maculatum),* sometimes is known as wild or spotted crane's-bill and is found from April to July in low deciduous wooded regions from Maine to Manitoba and south to Georgia and Nebraska. About sixteen species are found in North America, some of which extend to British Columbia and California. The first part of the scientific name is derived from the Greek word for crane, referring to the long beak-like fruit. The root is sometimes used in medicine and has an astringent action. The geraniums are all characterized by their rounded and deeply cut leaves. The flowers may be picked in moderation where they are abundant, but the petals soon fall off.

The Wind Flower, *(Anemone quinquefolia),* is found from April to June in low woods from Nova Scotia to Georgia and west to the Rocky Mountains. In Virginia it sometimes reaches an altitude of 3500 feet. There are about eighteen similar species native of North America and they belong to the Crowfoot family. The petals soon fall from the flowers.

The Red-Bud, *(Cercis canadensis),* also called Judas-tree, is found from April to May in rich more or less open woodlands from southern Ontario and New Jersey to Minnesota and south to Florida and Texas. One other similar species is found in the foothills of the Sierra Nevada and Coast Ranges. The name Judas-tree is derived from the tradition that it was a similar kind of tree on which Judas hanged himself. It belongs to the Senna family which was formerly included in the Pea family. It is one of the few plants of these families that do not have compound leaves. The flowers, coming out at almost the same time as the flowering dogwood, make an attractive color combination and are much sought after for bouquets. The red-bud may be readily grown from cuttings or seeds and is much used in landscape gardening.

The Yellow Adder's Tongue, *(Erythronium americanum),* is frequently called dog's-tooth violet, fawn or trout-lily. It is found from March to May in low, moist woods and thickets from Nova Scotia to Minnesota and south to Florida and Nebraska. About twelve similar species are found in North America, extending as far west as British Columbia and southern California. The bulbous root, about half an inch in diameter, is usually from three to six inches below the surface of the ground and is very difficult to obtain without breaking the stem. It belongs to the Lily family and the flowers in some species are white or reddish, the first part of the scientific name being derived from the Greek word *eruthros,* red. The bulbs and leaves are somewhat poisonous if eaten when fresh and have been used in the form of a stimulating poultice and applied to swellings. The plants will not grow again if the leaves are picked with the flowers. The eastern white flowered species are now rare as a result of thoughtless gathering.

Here is presented the life of one of the greatest figures in the development of American science. The article is written by one who knew him; one who was numbered among the younger naturalists who enjoyed the inspiration of Spencer Baird's personality. Dr. Dall of the United States National Museum is now one of the deans among American men of science and his own name will be writ large in the scientific history of our country.

Baird, Greatest of American Naturalists

By William H. Dall

GENIAL, modest, lovable to a degree beyond the lot of most men was Baird, the most distinguished of American naturalists in what may be called the second era of American Science. He was born at Reading, Pennsylvania, February 3, 1823. He lost his father at an early age, but luckily both his mother and his grandmother encouraged the love of Nature which showed itself so strongly in the boy.

The family moved to Carlisle, Pennsylvania, a region which, in the early twenties, was still the refuge of a multitude of birds and other wild animals, with the adjacent hills covered with a varied and luxuriant forest, their limestones containing an abundance of well-preserved fossils. The unpolluted streams and ponds offered a rich reward to the fisherman, and attracted in the time of migration great numbers of water fowl. No better field could have been found for a budding naturalist.

Baird entered Dickinson College, Carlisle, and graduated in 1836, at the age of seventeen. At this period, with his brother William, he engaged in energetic collecting, especially of birds. In 1843, the two published descriptions of two new flycatchers, and later a list of the birds of Carlisle. Spencer, in 1838, had begun a correspondence with Audubon, who recognized the merits of his young admirer, and the friendship thus started grew and endured during the lifetime of the elder naturalist. After graduation Baird made long excursions among the mountains of Pennsylvania, this open-air exercise strengthening his constitution against the unparalleled burdens of administration and research he was to bear. As science at that time rarely offered the means of livelihood, he began, in 1842, the reading of medicine in New York City, which gave him the opportunity of becoming acquainted with the most prominent men of science of that day. In 1845 he was chosen Professor of Natural History at Dickinson College and then began the strenuous life of research which characterized his whole later career. He corresponded with naturalists and amateurs in this country and Europe, amassed enormous collections, and in vacation times made expeditions in various directions from the Great Lakes to Virginia and Ohio.

Baird married Mary Helen Churchill of Carlisle, whose charming social qualities drew and retained many friends, and for the younger naturalists of Washington the privilege of intimacy with the household was a great boon.

Baird's modest and genial attitude made friends wherever he went, and it is probable that no other naturalist of the time was so widely known in America and so affectionately esteemed. Meanwhile he developed remarkable abilities in the line of administration, and his museum methods lie at the root of the best practices of the present day.

SPENCER FULLERTON BAIRD, 1823-1887

His great opportunity came with his selection, in 1850, as assistant secretary of the Smithsonian Institution under Professor Joseph Henry. The exploration of the West for transcontinental railways soon began, and through the influence of Baird the various parties were encouraged to make biological as well as geographical investigations. Baird's reports upon them, published by Congress, are classical. He joined to a marvelous faculty for

systematizing business, a capacity for steady and continuous work only limited by his waking hours. His frank, genial, and wholly unaffected manner put the scientist and laboring man alike at ease. Always busy, he always seemed to have time for a friendly chat with every newcomer. Not only did he hold amicable relations with scientists actually engaged in research, but there was hardly a schoolboy of extraordinary genius for bird-nesting or fishing whom he did not know about and encourage. This was greatly facilitated by the wide distribution of checklists of animals and monographs issued by the Smithsonian. The care he took to encourage and stimulate the younger naturalists who were so fortunate as to gain his attention is well shown in scores of letters still preserved, all written in his fine but legible hand, and affording a hint of the tremendous amount of correspondence which he personally carried on at a period when pen and ink formed the principal means of communication.

The unexplored regions of the West naturally claimed most of his attention, but through intimacy with Farragut and other naval officers, as well as members,—mostly surgeons,—of the Revenue Marine, collecting in foreign waters was promoted. The scientific work of the Coast Survey and the dredgings of the Fish Commission vessels *Fish Hawk* and *Albatross* under Baird's influence produced results which were of worldwide importance. Collaboration with Alexander Agassiz in dredging expeditions in both the Atlantic and Pacific produced a wealth of material.

In questions touching on exploration he soon became the adviser of the Government. No thought of self seemed to enter into his calculations. To fit the purpose best was his sole criterion, the purpose being always the promotion of science. Those who justly felt themselves the objects of his personal regard sometimes halted for a moment in comical dismay, finding themselves frankly moved like chessmen in directions which they would not themselves have selected and did not altogether like, almost as if they were perfect strangers. But an overwhelming sense of Baird's entire devotion to the cause of science, his perfect unselfishness, and his incomparable good judgment always carried the day, and the final outcome never discredited his generalship. To the tyro, treading with uncertain step the entrance ways of science, he was ever cordial, always a friend, guide, and helper. While Professor Henry lived, the affectionate loyalty of Baird to his venerable chief was an inspiration to those about him.

Among the organizations due to his initiative and now firmly established are the International Exchange of Scientific Papers, by which American workers can get in touch without expense with those of foreign countries; the National Museum; the National Zoological Park at Washington; and the United States Bureau of Fisheries, including the Biological Station at Wood's Hole. To his cooperation and advice the founders of the Geological Survey and the Weather Bureau were largely indebted. No man has more greatly contributed to the promotion of science in America than Professor Baird.

In the present day, when the field of science has so largely widened that students are forced to confine themselves to special lines of research, appreciation of the great naturalists of the past has become dimmed. Yet, if we pause long enough to consider the work of Baird—whose knowledge covered well so many fields, who worked for the love of his work, the promotion of science, and the illumination of the future, without selfishness or envy, and never entering into controversy,—we may better appreciate the grandeur of the man.

Worn with incessant work but regarding with satisfaction the sturdy growth of the institutions he had planted, Baird peacefully passed away at Wood's Hole, August 19, 1887.

Let Senator George F. Edmunds, long a friend and collaborator of Baird, give us a final estimate when he says:

"I knew Professor Baird intimately from the first year of my service in the Senate until the end of his life. I have never known a man who largely exercised public duties, who combined, more than he, great technical skill and ordered discipline in the sphere of all his activities, with personal gentleness and sympathy, or who was more readily supported by his subordinates in hard wark and in affectionate and almost reverent feeling. * * * With his great accomplishments he united great modesty and never self assertion,—a true man in the best and broadest sense of the term."

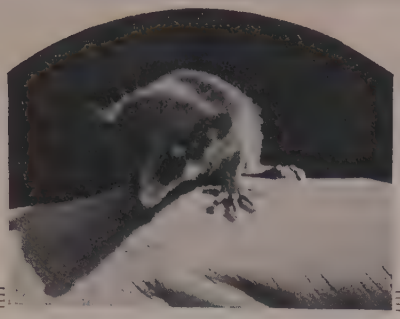
Watering A Million Trees

By WALLACE HUTCHINSON

ONE of the many duties of Uncle Sam's foresters is to raise little pines and spruces for the planting of denuded mountain slopes of our western national forests. For this purpose millions of little seedlings and transplants are grown annually in the Government nurseries. To supply this vast number of seedlings with sufficient moisture for proper growth during the hot summer months is one of the great problems of the tree-nurseryman. Sprays and other devices ordinarily used for watering lawns and gardens have been tried and found unsatisfactory, due to the large amount of work incident to moving the hose and spray-nozzles from bed to bed.

Forestry experts have therefore invented a system of overhead or "high-line sprays." These consist of a line of connected one-inch water pipes, with small holes bored in them every few feet, elevated ten to twelve feet above the ground on small iron posts and extending through the area.

THIS MONTH'S STORY



FOR THE CHILDREN

The Story of the Seven Stowaways

By MARJORIE SHANAFELT

Several of our readers, fascinated by the two earlier stories from Miss Shanafelt's pen, have asked to know more about her. We undertook to find out. She is associated with the State Museum of the University of Nebraska, where, she avers, she boasts "no grand titles." She adds that "one of my self-imposed tasks has been to raise the orphans who have crept, fluttered, or been carried in, pleading eloquently, 'Sanctuary'. In all I have nursed some hundred babies. So many people allow children to gather up wild creatures of which they soon tire, whereupon the orphans are often turned out-of-doors no matter what the weather. They come to the museum shivering with cold, weak with hunger, perishing with thirst. I call them 'museum babies' and there is always room for another cradle."

SEVEN of them! Six of them ridiculously small. A Mother Opossum and six babies! Not 'possums such as we know in this country, big as cats, with stiff whitish hair, but velvety brown, and so diminutive that mother and babies could all nestle in the palm of my one hand. Where had they come from? How had they gotten here? From British Honduras in a bunch of bananas!

We can only guess at the weeks that elapsed after Mother Opossum overslept in a comfortable bunch of green bananas. When she awoke she found herself a prisoner inside a burlap sack, fenced in by relentless wooden hoops. Jounced and bounced and nearly squeezed to death she must often have been as the crate was tossed from wagon to boat, from boat to train, and from train to platform on that long, long journey. At Lincoln, Nebraska, the crate was dumped in the basement of a wholesale fruit house and ten days later was shipped to a small town in the western part of the state. Sometime in those last few days six baby 'possums were born. We know they could have been no more than a dozen days old when a grocery clerk, in pulling out the bunch of bananas, spilled Mother Opossum, loaded down with babies, out upon the grocery store floor. Then there was a to-do!

After that heart-breaking, bone-wrenching journey, she found herself surrounded by excited monsters waving brooms or mops or handy sticks. She darted back and forth, the babies hanging on with tails, teeth, and paws. It would have gone hard with the little family if amongst the armed circle there had not been a bright-eyed boy who soon put down his stick, for he saw the babies. "Don't hurt her! She has babies on her back. That isn't a rat anyway." And so he rescued them and put them into a cigar box.

For a few days all went well, but Mother Opossum and her babies were not yet through with their journeying, for the boy became very ill, so ill that he had to be brought to Lincoln for an operation. Afraid to leave his little family behind, he managed to bring them with him, thinking he might be able to care for the waifs, even in a sanitarium. But the doctors and nurses thought otherwise, and so they followed the trail of so many wee homeless, sick, and unhappy wanderers, and were delivered to the Museum.

MOTHER 'POSSUM IN HER CIGAR-BOX HOME
Her six little babies, born somewhere between Honduras and Nebraska, cling to her.

Of the dozens of feathered or furred folk thus cared for each year, most are known to us and are to be found described at length in fat books on professors' bookshelves. But although we could see these were opossums and could even say they were Murine opossums, we were unable to learn more. The learned books contented themselves with a meagre dozen lines, and though the professors delved in all

directions, nowhere could we find a record of these opossums having made such a trip alive, and the only pictures we found didn't look much like our chubby balls of velvet, nestling in the hollows of our hands, and sucking our fingers with the smallest of pink tongues.

It was early fall. The days were chilly and cold rains made the Museum uncomfortable for us. For Mother 'Possum who had come from the warm, sunny South, it must have seemed as cold as the North Pole would to us. We tucked a lot of cotton wool into her box, thinking she would use it for a blanket, but Mother 'Possum had never heard of such a thing. She kicked it as far as she could. The babies were cold and Mother 'Possum was shaking with it. Two hot-water bags, filled with piping hot water were fastened on the outside of the cigar box home. Soon Mother 'Possum and the babies relaxed, stretched their slender legs, buried their noses and went to sleep. The bags had to be kept on the outside of the box for fear Mother 'Possum or the babies might burn themselves. This meant that the bags soon grew cool, so we had to change the water eight or ten times a day, and often had to make a trip to the Museum at night to refill them. At night, we gave extra warmth by half burying the box in warm sand, with their cigar box door shut up.

BABY 'POSSUM'S TAIL IS ITS ANCHOR
See how it is wrapped around finger and ring to make the hand a still safer place.

Mother 'Possum drank lots of milk, ate more banana than one could believe possible, and relished fat grasshoppers. The cool weather had made the hoppers sluggish so it was easy to keep a supply on hand. We tried her on nearly every kind of fruit and vegetable but without success. She didn't like us any too well, and opened her mouth and hissed at us just as a snake would do. She could bite, too, and her very white and very sharp teeth drew blood again and again when we reached in the box to borrow a baby to pet.

One day we tried to take a picture of the family group. No sooner was Mother 'Possum out of the box than she hustled all the babies upon her back. Little mouths biting into her soft fur, paws clutching, tails wound tightly about her larger one, they *were* a picture, but before we had a chance to snap it, Mother 'Possum with her load of babies jumped courageously from the high table on which we had placed her, and raced for a hiding place. We were in the basement workroom where the bones of prehistoric animals are mended and put together. All around were shelves bearing bottles, cans of paint, pieces of glass, all sizes of iron bars and piping, and everything necessary in the job. The floor beneath the shelves was full, while alongside stood great barrels of plaster and cement and sand. Into this wealth of objects dashed Mother 'Possum. We never expected to get her back. An electric light on the end of a long cord finally located her clinging to a piece of pipe, the babies hanging on securely. The light blinded her and we were able to throw a handkerchief over her head, after which we were able to pick her up and shove her, protesting it is true, into her cigar-box house. After that we took her picture through a sheet of glass, successfully, this time.

For such a family of midgets a cigar box was roomy enough but the babies needed a yard in which to romp so we put the cigar box into a large cage having a branch of a tree handy, about which Mother 'Possum might twist her tail. This she loved to do, dangling there with all the babies hanging on happily. In this position she would sip from a saucer of milk, fastidiously and daintily, as though uphill drinking were the only system. She began to grow more friendly and seemed to know that the babies were safe from harm, even if we did reach in and grab a baby that happened to be staggering around by itself. They were so cuddly. Just about an inch long. All six of them could sit along one banana and still leave plenty of room for Mother 'Possum to nibble the end of it. Pick a baby up by its tail and that tail would wind around your finger, holding him securely no matter how far off the ground he was. Their little feet, so like hands, made one think of suction discs, for in getting them back into their cage, they were as difficult to dislodge as cockle burrs from a woolen dress.

Every day we marvelled that they were all alive. Then one morning a baby was dead. We still had five babies. Their eyes were getting larger. Their mother's eyes sat on her odd face like shoe buttons stuck on with glue. The babies were romping all over the cage now, grabbing at each other's tails and squeaking like mice. They kept their tails rolled up into a coil most of the time, unless needed for active duty. They began nibbling at Mother 'Possum's grasshoppers, although she didn't approve at all. She would crunch down upon a fat hopper to discover another crunch sounding from one of its dangling legs. How she would slap her greedy baby and pull the hopper to the other side, but the babies soon learned to scurry over to the other side and go on crunching. At last she did not try to stop them. She probably thought them old enough for fresh meat. One day a baby stalked a large grasshopper by himself. The grasshopper hung on the side of the cage, one leg dangling enticingly. Snip, went the baby's sharp teeth into the hopper's shank. The hopper kicked the baby square in the

face, knocking him backward six times his own length. After sitting up and washing his face thoroughly, the baby tried it again. Mother helped him and poor Monsieur Hopper was devoured by the entire family.

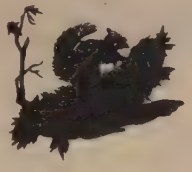
In the matter of washing faces members of the stowaway family were very particular. When one started the others sat down and did likewise. They didn't wash the way kittens do, but spread their five toes well apart, wet the end of them, and then combed down through their fur with widespread toes.

They were very thorough, too, and took great care of their delicate, hairless ears, and their silky whiskers which were just beginning to be attractive.

Another tragedy occurred. Two babies were found dead. This time it was probably grasshoppers. On the campus, a poison spray had been used to kill off the lingering hoppers of late fall, and presumably the babies had eaten a poisoned hopper or two. We were quite sure of this when another baby died before night. We went to the country for hoppers after that and brought in a great number to keep in captivity since frosts were now reducing the number of hoppers with distressing success.

Now there were just two babies and the mother. The weather grew colder and colder. The hot water bags were of no avail since the family seldom slept in the cigar box house. Again we tried cotton wool. Time after time Mother 'Possum would have nothing to do with it, but at last she discovered what a comfortable blanket it was and after that we found them in the center of the fluffy ball with just the tips of their pink noses sticking out. In spite of all we could do the long cold winter was too much for the mother. She dragged herself around and no longer fussed when we picked her up but liked the warmth of our hands. In the end she succumbed and now we have two little rascals left.

Months have passed and they are still happy; we hope they may live to a ripe old age in spite of our unfriendly climate. Their feet go scratching around the cage in a livelier tune as it grows dusk. As babies, daytime was as satisfactory as night time, but now they prefer the dark. When I sit in the half-light of the short winter day's closing hours, they come creeping out to see what entertainment the cage affords. If I pick them up, they squirm through my fingers, their whiskers, and their tails tying bow knots as they go in and out. They open their mouths in great yawns so that I can see their little pink tongues and their white teeth, but they never bite me now. In the summer when the days grow warm I shall fasten their cage outdoors so that warm breezes may carry to them visions of a land where bananas grow and the sun is always smiling and warm breezes blowing.



A Railroad Robin

By A. B. Brooks

BEING a member of the distinguished Thrush family the robin should have the best musical ability and tastes. A pleasing singer it is in fact; but we have good cause for saying that this bird is totally lacking in ability to appreciate the distinctions between sweet tones and harsh, unmusical sounds—at least such was the case of one pair of robins which made their home in a country district of western New York.

While other redbreasts built their nests on fence posts or window ledges in the neighborhood, and while other mother birds brooded their young through the still night, sheltered by the leafy boughs of some lonely apple tree or tangled vine, this foolish pair selected a building site on the surface of an electric signal bell which, night and day, clanged and banged an almost continuous warning to travelers on the crossing highway as train after train entered the block and went thundering by on the New York Central Line.

A STRANGE NEST SITE
Yet here a pair of robins built their home and raised a family.

How the frail eggs survived the shock is a mystery, but survive they did, and the young birds cracked the blue shells and came forth into what must have seemed to them a strange and noisy world! Instinct had taught these blind young fledglings to raise their unsteady, gaping mouths for food when the slight vibration caused by the parent bird alighting on the rim of the nest gave the signal. But here one long vibration after another kept the wabbling heads above the rim until they were observed to drop from exhaustion. After that only a gentle touch on the bill and a low note from the parent bird could undeceive these helpless offspring of a pair of robins easily satisfied with a home site.

American Nature Association Activities

BELOW there is reproduced a "before and after" picture depicting simply and yet effectively the result of uglifying the landscape with billboard advertising. This illustration is taken from a poster made by a student in the Englewood, N. J., high school, and it won the prize offered for the best poster by the Contemporary Club of that community.

In cooperation with the National Committee for the Restriction of Outdoor Advertising, the American Nature Association urges Rotary and Kiwanis Clubs, civic groups, women's clubs and other organizations of constructive character to offer moderate prizes in similar contests. Such an activity is valuable in the moulding of public opinion and spreading the realization that the landscape is no place for advertising that desecrates it.

In the box on this page is an announcement of the great national cartoon contest of the American Nature Association. Entries in such local poster contests as suggested will be accepted in the cartoon contest, so the winner of the local contest also has an opportunity to win one of the prizes in the national contest.

The National Committee, with offices at 119 East 19th Street, New York City, will send literature to clubs wishing to establish such a contest. Write to the committee for suggestions and advice.

The organized outdoor advertising industry professes to be mending its own fences. On Long Island there has recently been erected "the largest billboard in the world." It was erected by the Organized Industry. It is claimed to be 780 feet long, 60 feet high and visible for ten miles in all directions when it is illuminated.

Do you want such a signboard in your neighborhood?

Our scenery is a possession beyond calculation in value. The Organized Industry has agreed to respect certain sections that are scenically notable. This does not affect the landscape that is just beautiful in a quiet and non-spectacular way. This is also worthy of respect. It should not be posted and painted. It is too valuable to be commercialized.

A group of large national advertisers agree to this view and have decided to withdraw their signboards from the landscape to purely commercial districts. Let us hope that this is a symptom.

As in the solution of many of our national problems of the conservation and the wise use of our natural resources, public opinion will be the deciding factor. This opinion is shaped and aroused by the leading groups and individuals in a community, and fused into a national sentiment through nation-wide organizations. In this work the American Nature Association is cooperating.

Be the leading force in your community and establish a contest. Then send the winner to the American Nature Association contest.

THE CARTOON CONTEST

National interest has already been awakened in the Outdoor Good Manners Cartoon Contest of the American Nature Association. This contest seeks to bring out the three cartoons best expressing the need of roadside beautification and is directed against the various desecrations of Nature's beauties. Three prizes of $100, $50 and $25 will be awarded, and a year's membership in the American Nature Association will be given to all whose cartoons are accepted for printing.

The contest will close April 1, 1927, and the awards will be announced in the May issue of Nature Magazine. No cartoons entered in the contest will be returned unless accompanied by return postage. Cartoons should be sent to:

CARTOONS, NATURE MAGAZINE
1214 Sixteenth St., N. W., Washington, D. C.

BEFORE

AFTER

"THREE CRANES ON THE WINDY HILL"

VALIANT LEADS THE V

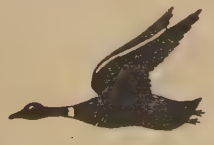
By Ben Hur Lampman

(ILLUSTRATED BY R. BRUCE HORSFALL)

VALIANT acquired wisdom as they flew. He derived it from the demeanor of the Old One, and from his own intuitions. Thus, when the men-creatures were plowing in the fields, they were not greatly to be feared, and it was good to follow them, though warily, gathering food from the broken furrows. And men who held a straight course, walking steadily on road or prairie, did not affright him, so long as they did not approach the flock—for clearly such men were bent upon their own affairs. As for children, who ran and shouted, and laughed beneath the winging geese, there was not harm in them. At such times the Old One did not order the flock to climb skyward, in the sharp, almost vertical ascent that drops the earth like a plummet. But those men-creatures who crouched, or ran to cover, or who carried with them the gleam of metal, for these—"Mark! O mark!" And the flock flew wide, or hurdled the peril on towering wing. Nor was it altogether a test of visual evidence. Men radiated safety or danger, and of this subtle difference the Old One often spoke. He said that Valiant must learn it for himself. But the young gander, so it chanced, met with the crane people, and they aided him in his lessons. It was a sun-drenched afternoon, on a brown hill, swept by the south wind, where Valiant and the comely goose came upon the cranes, those sandhill sages whose learning is famed wherever wings are lifted.

Three cranes on a windy hill, and one of these a tall tom-crane, redly bald of head, with a calm truculence biding in the orange eyes of him—a warrior bird of gray-blue plumage, instant for any stratagem of flight or conflict, the strong wings his warrant for escape, the slender, deadly bill his javelin for battle. Off to the east, on the level field, fed a flock of cranes, that seemed, as they bent to their gleaning, like so many sheep at pasture. They on the hill were proved sentinels, and though the three cranes fed, one vigilant head was always lifted, turning now this way, now that. It was plain they understood their duty, for each tall sentinel watched for a measured moment, then fed while a companion stood guard. This they repeated with well nigh mechanical regularity, as perfect in drill as the king's guardsmen. Valiant and the comely goose approached the three, circuitously, and drew near as if by incident and not design. Then, at a distance of two wing-beats, the gander met the level gaze of the tom-crane, and the calm fierceness of those orange eyes searched him.

This is the conclusion of the romance of Valiant, the first part of which appeared in January.



"O father of the crane people," said Valiant, affecting to arrange a feather, "may Earth-Maker give you grain forever!"

"Welcome, goose," answered the crane, "and to your mate, welcome."

"Your pardon, for I have no mate," said Valiant. "Know that I am sentinel to the flock, and she watches with me."

Into the warrior eyes glanced a flicker that may have been a trick of the sun, or of laughter—they are so much alike—and the tom-crane stretched right wing against right leg, parting the javelin bill to yawn. Valiant stared at him suspiciously, but the bald hero was grave again, and searching the country to its horizon. To the west fed the Old One and his company. To eastward fed the crane people. The sentinels watched and gleaned together, and as they did so Valiant questioned the tom-crane on the determination of peril.

Sagacity is never proof against the flattery of youth, of youth that does not hide an admiration, nor own an envy, and to which the lightest word of the sage is scriptural. And though they spoke of many beasts that prey, and of good birds fallen to this peril or that, they talked mostly of the men-creatures, that are conceded to be almost as crafty as the birds themselves. The tom-crane had grown old as a sentinel, and could read the movements of men as men read books. Thus, he bade Valiant observe two plowmen, widely apart, their furrows creeping slowly through the golden stubble. And Valiant looked long at them, presently remarking that both were plowmen and at their own affairs.

"Both are plowmen, yes," agreed the

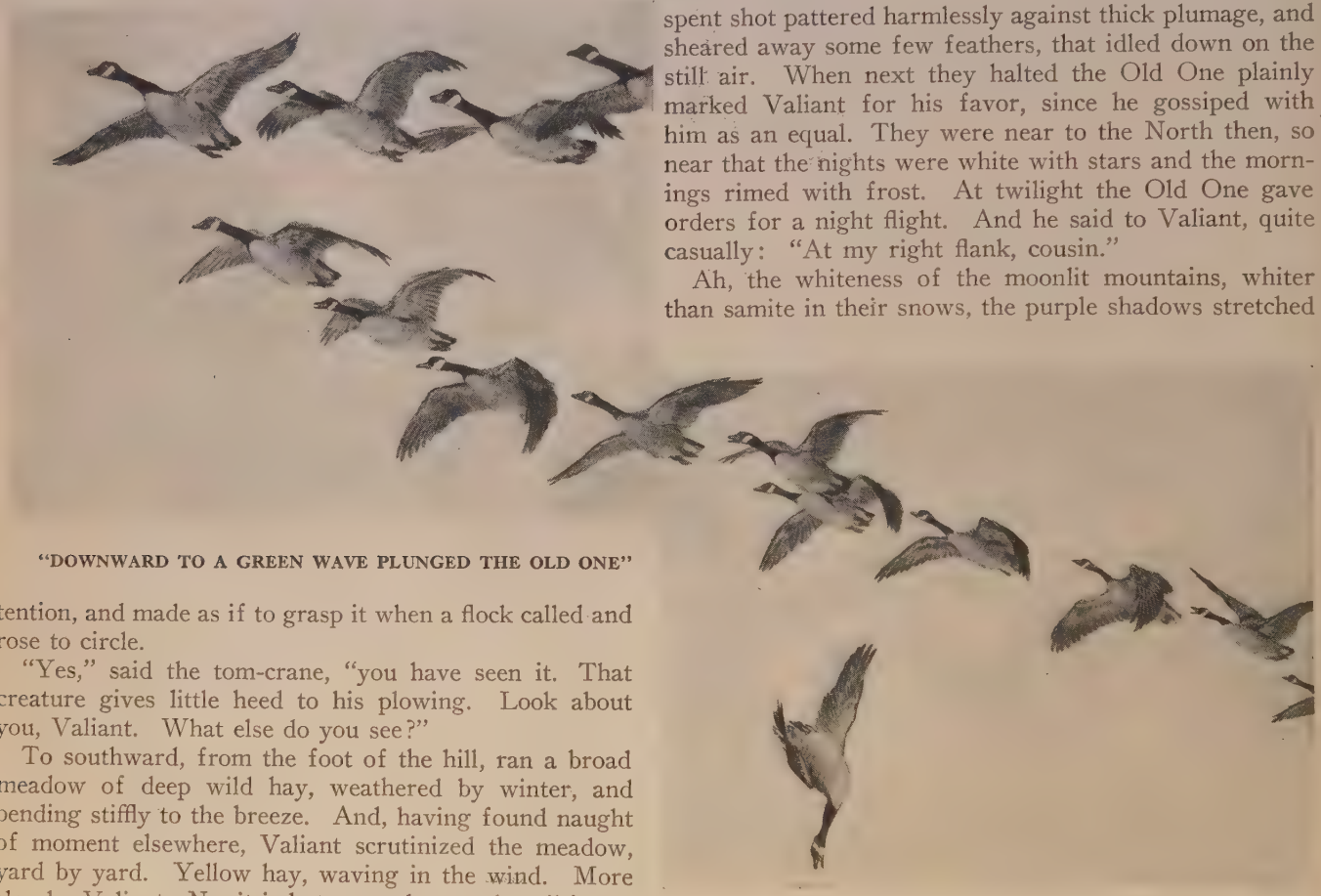
tom-crane, "but one———. Look closely, Valiant."

The plowman to the south turned and regarded the hill, and clucked to his horses—the far faint sound came to them on the wind—and turned again. In every feather and fiber Valiant stiffened. His wings tingled. Almost the bugle sounded in his throat. Across a long mile death gestured.

"O wisest of cranes——" he began, but the warrior motioned him to silence.

"Look again, and yet more closely," urged the tom-crane.

And Valiant saw a glint that was not the shine of a plowshare, nor yet a buckle on the taut harness—but the blue radiance of the tube that makes birds quiet. And saw, too, that the plowman gave this radiance much attention, and made as if to grasp it when a flock called and rose to circle.



"DOWNWARD TO A GREEN WAVE PLUNGED THE OLD ONE"

"Yes," said the tom-crane, "you have seen it. That creature gives little heed to his plowing. Look about you, Valiant. What else do you see?"

To southward, from the foot of the hill, ran a broad meadow of deep wild hay, weathered by winter, and bending stiffly to the breeze. And, having found naught of moment elsewhere, Valiant scrutinized the meadow, yard by yard. Yellow hay, waving in the wind. More closely, Valiant. No, it is but a meadow, and peril is not hidden there.

"So?" said the tom-crane, quizzically, and as he spoke he beat strongly with his wings, as did his fellow sentinels, took three springing strides on those long shanks of his, and rose, trilling the alarm.

"C-r-r-e-ew! C-r-r-e-ew!"

The three cranes winged toward their flock, and even at that moment the flock itself was a-wing and mounting. The air was vibrant with the sharp, ventriloquial cry of the crane people. Danger! There was danger near at hand! Valiant glanced again at the yellow meadow. The wind tossed it. But that—was that wind, so centered, so cautious in its flutterings of the grass? Both geese were lifting nervous feet, and their heads jerked keenly to right and to left. The meadow had ceased to move so oddly, but Valiant and the comely goose sprang to wing, and as their pinions caught the air they shouted to the flock.

"Mark! O mark!"

Behind them, from his cover in the meadow, a man stood up, and with no further endeavor at concealment walked to the foot of the hill, and laid aside his gun. He filled a pipe, and sprawled there, the sun warm upon him.

A wise covenant between two great neighboring nations, as doubtless you know, forbids the hunting of waterfowl when the birds are hastening up from the South, to their mating, and the rearing of broods. Nevertheless, Valiant had frequent need of his craft, for though laws may be made, they may be broken, as well. And twice, when the flock flew low, it was Valiant who read the signs, that even the Old One had failed to descry, and sounded the alarm. And once they were so near to death, hidden in a swamp, that the voice of Valiant alone saved the flock from loss. As it was, spent shot pattered harmlessly against thick plumage, and sheared away some few feathers, that idled down on the still air. When next they halted the Old One plainly marked Valiant for his favor, since he gossiped with him as an equal. They were near to the North then, so near that the nights were white with stars and the mornings rimed with frost. At twilight the Old One gave orders for a night flight. And he said to Valiant, quite casually: "At my right flank, cousin."

Ah, the whiteness of the moonlit mountains, whiter than samite in their snows, the purple shadows stretched across the valleys, the sheen and shouting of many rivers—and the tonic breath of the sea. In starlight and moonlight they floated mile-high above great arms of ocean, flung far inland, and saw the dark, complaining tides yield an offering of pearl to the chill night. On they flew, and ever on, and it was as though all the flocks converged toward some goal of heart's desire, for the night was cheerful with voices that spoke eagerly of April, of the time that, to the birds, is not a month, but a season and a presence. When morning broke there was neither town nor tilled field to be seen, and the thin air was sharp and sweet as a choice vintage. Wherefore Valiant and his fellows cried a greeting to the North, and to the battered headlands that are its outposts.

And they swung down, as the Old One led them, wearily, happily down, toward a mist that was a lake, cupped in the dunes, quite hidden by stately spirals of vapor.

For to the flock there came, as from the throat of their own kind, the call that speaks of safety and sweet water. The Old One answered it, circling from habit only, then, at a level almost sweeping the rushes, he and his voyageurs approached the welcome. And they who gave it, the two men-creatures crouched in the midst and tangle, made ready the long trade-guns, loaded with swan shot, and drew back the flints, and sounded the call again—as only savage tongue can give it. Then the Old One, with Valiant at his right flank, and all the flock behind, loomed huge through the veil, peering to either side. At the first movement of the crouched figures—nay, almost ere it began—the Old One beat at the murk with frantic wings, and bade his followers sheer away and climb. Mark! O mark! There was no terror in his deep throating, but a warning that thrilled them with its urgency. Their wings thundered as they mounted.

Swift as dream the rushes faded. The mist was stabbed with twin flames. Valiant heard the lead rip keenly through the pinions of the flock. From his own wings floated flight feathers, wavering down. Yet none of the geese so much as faltered. The V took shape again. He called exultantly. The Old One gave no answering cry, but led them outward to the white surf, and over it, and into clean sunshine. Was it spray or spume that dashed in Valiant's eyes? No, there was an odor of fear. Under the laboring right wing of the leader he saw a tuft of moistened feathers, and red drops were whipped away from the Old One's nostrils. Dread came to Valiant. He sped forward to the Old One's side. The flock had taken up its measured chant again.

He saw the wise wild eyes turn dim and sightless, the outstretched neck droop to a will it could not then deny. And downward, downward, without call or tremor, downward to a green wave, plunged the Old One. Thus Valiant led the flock.

This is by way of being an inaccuracy. His was the titular leadership, and he had earned it fairly, but the flock that followed him chatted forever of April, and urged him to quite the beaches and the dunes. Valiant rejoiced in the sea-wind, and in the strange bird people he met beside the sea; moreover, the pastures were sufficient. Why should they leave so fine and free a province, to follow a fancy that seemed less than the shadow of a dream? April, forsooth! Nevertheless, he was constrained to seek some private word of April, from others than his enchanted companions; and, seeking, he met and talked with the phalaropes, a very gentle-spoken company, winsomely garbed.

Valiant thought them to be of the snipe clans, and since all snipe are famed for eccentricity, their whims and fancies, he concluded that they might inform him of April, and where she might be found, and what profit there was in finding her. Judge of his astonishment, therefore, thinking them snipe, to see them trip it away into deep water, without fear or floundering, and bob daintily about as though engaged in the politest drill imaginable. For all phalaropes are famous swimmers, and, indeed, their affairs wing them often far from sight of land, to seek the whales that are their friends and patrons. Well, setting aside this matter of swimming, they did, indeed resemble snipe. Where was the comely goose? She stood apart and listened to the flocks that were flying inland. And, almost stealthily, Valiant steered toward the phalaropes.

"DO NOT FRET FOR THEM, VALIANT"

"What do you know of April, little friend?" he asked, towering above them, a schooner among skiffs.

Whereat the phalaropes all began to talk at once, in the pleasantest, softest, most amiable confusion one ever heard, like a medley of elfin music. And Valiant gathered only that April was both a country and a state of mind, and of the heart, as well; and that for some it was here and for others yonder, but that, wherever it was, the goal was worth the seeking. April was fluffy clouds, and sunshine, and a wet wind, and a crag breasting the spume, and song, and laughter, and silence—long, calm, contented dreaming. April was a great bird, like an enormous phalarope, brooding the stars.

"O sirs!" cried Valiant, mazed in the music.

All the phalaropes gave little tweets of dismay and expostulation. Sirs, indeed! Trust a goose not to know that in the phalarope clan it is the males who warm the eggs, and tend the fledglings, while the she-ones play together, and wear the richer plumage. And these were

mother phalaropes on an outing—matrons to the last bird of them! You may well believe they were greatly agitated, the charming little Amazons, and surely they would have reproved the culprit as soon as they had mastered a natural chagrin. Valiant gaped at them. But far at sea, at that moment, a broad black back glistened, rising from the deep pastures; and every phalarope bobbed to attention; mounting a wave to look. Up sprang a jet of vapor, drifting, thinning to the wind.

"Ah, bl-o-o-o-w!" sang all the phalaropes as one, and flew away seaward, leaving Valiant still at loss.

And he hailed a passing surf duck, black as burnished midnight, with white patches at nape and forehead. The drake swung in and settled, as sturdy and practical a fisherman as ever sounded the white tide for his dinner. April? Yes, it seemed the surf duck knew of her. He preened his wings with parti-colored bill. For his people, he said, April was here; whereat Valiant looked all about him. The sea was smooth. The flock slept in a row at the edge of the surf. Three cormorants went laboring by. And there was naught to be seen save sea and dune, and headland and birds. The drake had grown drowsy, and his stout head nodded.

VALIANT CALLED TO THE COMELY GOOSE

"Have you looked for April elsewhere?" he asked, shaking himself awake, then seeming to drowse again.

"We came from the South," answered Valiant, "and nowhere have I found April."

"Search beyond the dunes, for your own lake," said the drake, "I think—"

And where he had been there was an eddy of jade in the sea, and a pearl floating. The comely goose called then to Valiant, and he swam reflectively ashore.

"And need you talk with ducks?" said she. "With oystermen? Talk with me, Valiant."

It was in these pleasant days, whose nights were frost-rimed, that Valiant bethought him of his trust. For, reasoned he, if the Old One had sought April, then surely he must seek. Such was his obligation to the flock. And, too, the flock was mildly mutinous; he felt its laughter when he turned his back. Without so much as begging leave of him, six of the free companions flew away. Strangely enough, three of these were young ganders, as he was, and three were plump she-geese. Though he mounted the highest dune and trumpeted the recall they gave no heed, if they heard, but flew on and on to be lost in sunrise. It was evident from the restless demeanor of those who remained, from the covert glances they cast at him, that his leadership was in jeopardy through desertion. What then? Ah, the Old One had been swift in his decisions. The Old One had not hesitated. As for this something the world called April, it might well lie in any direction.

"Come!" he bade them, and rose to wing, the yellow dunes beneath, the wide north country spread before. They chanted the flight song as they followed, but they gave it a new meaning.

Of the land they flew over, let it be said that the land is new, as though but lately from the hand of creation. It is new and unspoiled, and set with many lakes, each surpassing the other, and threaded with many rivers, and no river among them but is the peer of the fleetest. And men are few and birds are many, and the least of its streams is populous with trout, and in its forest ponds the moose stand pensively, nipping and tugging at the lush water growths. From every river Valiant glimpsed the brilliance of thrown silver, now taut against the curtain of some thundering waterfall, now lifted high above a dark pool. The salmon were in mad haste to regain the upper reaches of their native streams, and as he glanced at them the gander marveled at their urgency.

"These fish?" he asked the comely goose.

"Seek April, too," she said.

"And April is in rivers!" mocked Valiant.

"In rivers," she replied.

For long he had known the path they traveled. They would rest that night in a pond ringed round with meadow, and fed by a small chill stream, ice-born, hasty, with willows at either side. And at the midday following they should raise from distance, by the strong effort of their wings, a low blue huddle of hills . . . nearer and nearer, until each stunted tree, each tangled shrub, would be described. Beyond those hills, his lake—the lake whereon he had floated as a gosling, the lake where the falcon stooped and missed its strike. Where the blue fox was foiled. For if the rice fields had been home to him, this, too, was home. His thought leaped forward to meet the unfolding picture of the north.

When they settled from flight that evening, slanting down to the pond, there were no more than a dozen birds in the company, and these gave little heed to him. Others had dared to quit the flock as it flew inland, and their far, faint calling had mocked the leader. Nay, while yet they drank, with sunset flickering redly over the pond, three couples rose, circled and sped away, fan-like, two by two. And in that dark moment before dawn, when he stretched himself with buffeting wings, and bade them all prepare to fly, the beat of rising pinions answered him and he was alone on the pond, save for the comely goose. He called, but they did not answer. He called again, and the echo of his first summons came in dim reply. And he was lonely with a loneliness greater than might be endured, for it seemed to him that a leader without a flock was spent and worthless, and fit for the mockery of the sky. Then she pressed close to him, and with her beak she dressed a rumpled feather on his back.

"Do not fret for them, Valiant," urged the she-goose. "Thus it was with the Old One."

"Nay," grieved Valiant, "for he was a leader in all truth, while I—"

"Thus it is when the flock finds April."

At mid-day, these two alone in the sky line—with the heart of the gander hungry for his own lake, yet heavy with loss—they raised the huddled hills and crossed this barrier, and presently shattered the still water as they struck. And a trout leaped near the margin, and a bittern glanced toward them as it waited in the shallows. Then a grebe, very huge for one of his people, whose neck and head flamed red as a rajah's jewel, slipped smoothly out of the depths before them. He turned that wonderful hue now this way and now that, ceaselessly alert; but he had risen to see these new arrivals. Of all birds the grebes are not last in curiosity.

"Grebe," asked Valiant idly, yawning with happiness, "where is April?"

"Why, here to be sure," said the grebe, and with that the marvelous plumage of his nape and crown swelled visibly, until each silken filament of feather stood on end with quick belligerence. Valiant eyed him amiably. An odd, fantastic bird, he thought, with odd, fantastic fancies. The grebe was gone, and no least whirl marked his plunge. It was good to be back again, in the province of one's birth. He sent a cry into the charmed stillness, and from far off a cry answered it. The comely goose seemed lost in dream.

That morning he led her a brief flight to eastward, where new grass was to be had, and water rested on the turf in delightful puddles, and here and there a brown and crusted mound of snow yet resisted the sun. When they had fed to repletion and drowsiness was upon them, they mused beside a snow mound that broke the breeze. And Valiant drew a little apart that he might have his thoughts to himself, and ponder his lost leadership and speculate on the scattered free companions. There he recognized and nursed a loneliness such as he had never known, and though indolent in the sun he was nevertheless restless at heart, dissatisfied and yet content. Ah, it was difficult to be a goose and a leader. But the comely goose slept, unperplexed, motionless, content.

It is so and at such times that death comes often in the north, velvet-winged or velvet-footed, silent as shadow, hungry and pitiless. Over the mound there drifted a whiteness with round forward eyes of ebony and pale gold, and the stroke of its broad wings was muffled by down, and the cowled head was calmly, confidently terrible. With that warning which a falling shadow gives, that and no more, the arctic owl dropped upon the comely goose, its talons clutching, rending. And she trumpeted in terror, and beat with futile wings at the winged white death that gripped her. In the voice of her terror, Valiant heard his name. Whereat the wilderness swayed in a red blindness, holding naught save these three, and with a cry and a wing stroke he was upon them, buffeting this monster that had dared. With the stout knuckle of his wing he beat the thing away, and as it rose, yellow rage in its eyes, its grip fastened somehow in his own breast, he struck it with hissing head, blindly, bravely, in that red haze of battle. Of his own wounds he had no thought, and in his fierceness he tossed the thing from him, to strike it down, to follow and to strike. The hollow rang with his clamor. It must die! He hurled himself toward it again. But the great owl rose and was gone, as mutely as it had come, and the wind played with strewn feathers, soft and white—of which the thrifty longspurs took full toll that season.

Boastfully he called, as a gander must, ere he turned to the comely goose—but when he turned his rage was strangely abated, and all his thoughts were tender and compassionate. She stood there, pride in the look she gave him, the sleek head lifted, the wild eyes bright, and soft, and beckoning. And a marvel came to the north, as it has come these many centuries past—for Valiant saw that she had grown so vast as quite to fill the sky, and that her gaze was mystic; knew her slim throat to be filled with music, and the least item of her plumage to have the value of his life. More, he was aware of what the wind was saying, and he knew the secret of the springing grasses, and why the grebe had decked its pate with rubies. The swift joy of comprehension was sweeter than water after long flight. And there she stood once more, that comely goose, gazing at him.

"You might have told me," he complained, for it is so they always must complain. "It is you who are April!"

"O brave and foolish Valiant," she answered, "indeed, you might have known."

In addition to an article beautifully illustrated in color, the March issue of NATURE MAGAZINE *will have a full-page reproduction in color from a painting by R. Bruce Horsfall. It is one of the most effective pictures of the many that have come from our artist's facile brush.*

Other features in the March issue will include an epic eagle story by Ben East; a fascinating story of the pangolin by Samuel Scoville, Jr.; the second installment of the Association's expedition to the treeless islands of the Bering Sea, and many other notable and valuable features.

NATURE EDUCATION

Prof. E. Laurence Palmer, Cornell University, Director

ASSOCIATES

Prof. George R. Green, President, American Nature Study Society.
Prof. J. A. Hollinger, President, National Council of Supervisors of Nature Study and Gardening.
Mrs. Elizabeth K. Peeples, of the Washington, D. C., Schools.
Prof. L. D. Wooster, Kansas State Teachers College, Hays, Kansas.
Miss Clelia Paroni, Supervisor of Nature Study, Berkeley, Calif.
Dr. Bertha Chapman Cady, Girl Scouts of America.

Meeting in Philadelphia Highly Successful

In these days of data, test results, and scientific analysis, it is a rare refreshment of the spirit to attend an educational meeting where speaker after speaker places inspiration above scientific method, enthusiasm above knowledge, and appreciation above achievement. Especially is this refreshing when the gathering chances to be one in the field, or at least on the outskirts of the field, of science. Such was the sense of the joint meeting of the American Nature Study Society and the American Nature Association held December 27 and 28 in Philadelphia. Or was this the only characteristic of the meeting worthy of remark? Harmony, helpfulness and high hopes for the future, were its spontaneous keynotes.

President George R. Green of Pennsylvania State College presided, and in the absence of Dr. E. L. Palmer, Miss M. R. Ross, also of this institution, acted as secretary.

A climax was reached in each day's program when on Monday Mrs. Anna Botsford Comstock, President-Emeritus of the A. N. S. S. and "mother of Nature Study," to borrow Prof. Green's phrase, spoke on "The Future of Nature Study," and on Tuesday when Dr. Liberty Hyde Bailey, President of the American Association for the Advancement of Science, delivered "Comments on Nature Study."

Mrs. Comstock stated that the progress of Nature Study in the past twenty years, despite heavy obstacles, encouraged her to take a prophetic flight in which she visioned a world made better through love and understanding of Nature.

Dr. Bailey's presence was a signal honor as this was the only meeting which the president of the American Association for the Advancement of Science found it possible to attend because of pressure of conference and committee work. Dr. Bailey renewed his early interest in Nature Study, and his assurance that it had not diminished with the passing years could not be questioned by those privileged to hear him.

"The Evangelist of Nature Study," Dr. S. C. Schmucker, spoke of the purpose of the work as enrichment of life through culture, character building and establishment of an abiding faith.

Other recent trends in the work were discussed by Laurence Vail Coleman, Wm. G. Vinal, Lester Scott, and Arthur Newton Pack, President of the American Nature Association.

Mr. Pack's request for frank comment and suggestions as to how Nature Magazine may be made more helpful to Nature education called forth expressions of appreciation of the magazine from Mrs. Comstock, Dr. Bertha Chapman Cady, Director of Nature Study for the Girl Scouts, Miss Conover, Director of Nature Study in Detroit, and Mr. Lunn, State Superintendent of Schools of Connecticut. Last year's officers were unanimously reelected.

IMPORTANT MEETING

Another important meeting of interest to those working in the field of Nature will be that of the National Council of Nature Study and Gardening Supervisors at the Hilton Hotel, Dallas, Texas, February 26. There will be an all-day session attended and addressed by a number of leaders in the field, including Hanor Webb, Alice Jean Patterson and E. Laurence Palmer. Members of the American Nature Association are invited to attend.

Important resolutions passed at the Philadelphia meeting provided: That an expression of appreciation be extended to the American Nature Association for its cooperation with teachers and pupils, and that the American Nature Study Society bespeak the further assistance of the American Nature Association as needs arise.

That the American Nature Study Society recommend to the Council of the American Association for the Advancement of Science the advisability of forming a Pacific Coast Branch of the American Nature Study Society.

That the organization express itself as favoring representation in the Coordinating Council on Nature Activities already established under the American Museum of Natural History.

A Flank Attack On The Forest Problem

By Otto Wilson

PHOTOGRAPH U. S. FOREST SERVICE

FIRE IS THE GREATEST SOURCE OF WASTE
Here brush is being piled and burned to reduce the hazard and to discourage the red enemy and his hungry flames.

AS A TERSE and pithy proverb reminds us, there are always two ends to a stick. But why should we need a proverb to tell us that somewhat obvious truth? Clearly because we forget so often that this two-endedness carries over also into the world of busy human activities.

Take, for example, the several lines of activities looking toward the intelligent use of our forests, usually grouped under the designation "the forestry movement." For a generation past our forestry enthusiasts have indeed done their work well. Everywhere today there is a settled conviction that our forests should be well used and not merely used up. But that is really only half the story. What we have not appreciated is that the vast quantities of wood that flow annually into our humming national life might serve us to an immensely better advantage than they do. In rescuing our trees we have fixed our eyes almost wholly on the "producing" end of the forestry stick. Only now are we beginning to realize that there is likewise a "consuming" end.

"Waste is the cancer of forest use," say The Forestry Primer of the American Tree Association. This article by Mr. Wilson, writer on subjects of commerce and economy which have their Nature and conservation angle, is a significant discussion of this very thought.

A century and a quarter ago the hardy American race, like a young and brawny giant, stood looking out over some two and a half million square miles of scarcely touched forest and plain. With lusty vigor the young giant threw himself into the great work of settling a continent. The trees were in his way, and with ax and flame he cleared a path for the plow. But the giant had brains as well as muscle. And after a hundred years or so of slashing away we see him stopping to take stock of his tree heritage.

"See here," we hear him saying to himself, "this can't go on forever. These forests do have limits. I must cut more judiciously. I must check the forest fires. I must plant as well as harvest."

Thus, not so long ago, the forestry movement was born. It is indeed only in its beginning. But already the ax-swinging giant has again paused in his labors to take thought. This time his eye does not stop with the great stretches of timber or the whirring steel circles of the devouring mills. It follows the wood to the carpenter's trestle. It lingers on the long miles of railway and wire fence, with their myriad ties and posts. And the things it sees there and in the scores of other employments for wood bring to the mind of the pondering giant the highly pertinent question:

"What does it profit me to plant new trees when I am not really making good use of those I have?"

So, very recently, a movement has been launched by the wood-using interests of America, sponsored by President Coolidge and under the active management of Secretary Hoover, to help the ultimate consumer get a fuller value out of the wood that reaches him—to attack the tree-saving problem, as it were, in the flank. If three sticks can be made to do the work which four have been doing, then perhaps three trees only will have to be cut instead of four. Or if the ratio is not that large, at least it is large enough to be highly worth while.

In the city of Washington a national committee has been set up, with headquarters in the Department of Commerce, which is not only urging the wood users of the country to get a better value from their material but, more importantly, is showing them precisely how they may do so.

This new body, the National Committee on Wood Utilization, with its numerous subcommittees, is really but one more evidence of the new spirit of these times. In every direction the American nation is coming to realize that the old days of riotous and prodigal use of our great stores of natural riches are about over. Especially since the close of the war has there been much sober thinking on the subject of how we can get more out of our resources—of how, quite frequently, we can turn to the odds and ends instead of dipping forever into the main supply. Let us see some of the results of this process of taking thought as applied to the use of wood.

The great demand for wood, of course, is for use as lumber in the building of houses. Now for a long while carpenters have been accustomed to ordering their lumber in "even" lengths—eight feet, ten feet, twelve feet, and so on—and the dimensions of houses, especially the smaller houses, have been determined accordingly.

PHOTOGRAPH U. S. FOREST SERVICE

SOME USES OF THE SMALL PIECES

These sixty novelties were made from wood waste and show the possibilities of efficiency.

But there are numberless instances where the builder needs an odd-length board. If it is not to be had he has nothing to do but to cut off the end of an even-length board—and perhaps fifteen or twenty per cent of that high-grade wood drops to the ground, to be gathered up as scrap and find its way into the furnace.

The same thing, of course, occurs at the mill, where a board with a length, say, of nine feet, nine inches must be cut to eight feet because the user insists on even lengths. No one knows what a tremendous loss this entails every year, but it can be stated only in terms of tens of millions of dollars.

When the experts of the Government's Forest Products Laboratory, at Madison, Wisconsin, made a study of this source of lumber loss they found that very nearly one-half of the lumber used in building our small houses was, or might be, of odd lengths. Think of the tens of thousands of flashing saws in the hands of carpenters all over the land, busily spoiling high-grade lumber merely because of this even-length custom.

Then there is the question of short-length lumber. Except in a very few lumber items it is unusual for a piece of lumber less than eight feet in length to be included in standard specifications. The practice has simply grown up of looking on anything less than eight feet as undesirable.

And yet when the carpenter constructs a small house he is nearly always, from start to finish, using boards, posts, sills, studding, braces, and other items shorter than eight feet. And often when he does not there are many instances where the plans might be slightly changed so that the shorter lengths would serve as well.

"Of course," says the wielder of saw and hammer, "that is easy to say as long as you speak in general terms. But if you were doing the actual building, just where do you suppose you could put in this short-length material and just how much of it do you suppose you could use?"

The national committee has made a survey to answer those questions precisely.

"We have studied all the usual types of small houses," it replies, "and we find that, in the framing, for example, you can conveniently use lengths less than eight feet in one-fifth of your work. The actual amount of such short-lengths which you now ask for in your mills of material is one and one-half per cent.

"Three-fourths of the posts you use could be of short length, instead of the one-half you now order. One-seventh of your sills, instead of one-one hundredth, could be less than eight feet long, and one-sixth of your plates could be short-length, although you now buy hardly any such. And what is true of the framing is true also of most

of the rest of the wood material that goes into a house."

Do any of us ever really realize, after all, what an enormous activity goes on in this great United States? It may help us to appreciate the extent of its building industry, at least, when we hear the lumber experts tell us that the rescue of this short-length lumber from the scrap-pile would alone mean a saving of some $100,000,000 a year. In terms of trees we can only imagine what it would be. It certainly is well worth the saving.

All along the line of the building process we find these instances of the value of taking thought. Take the matter of flooring. Every boy who has helped lay flooring knows that you must saw off each strip so that the end will come just half-way across the edge of the joist to which it is to be nailed. If it projects beyond the joist you have an unsupported end and a weak place in the floor.

But suppose the ends of the boards are tongue-and-grooved like their sides. Then they can fit firmly into each other to make a solid floor and there will be no necessity for cutting each board. There will be far fewer scraps for kindling. But kindling at the cost of high-grade pine flooring is, after all, a bit of a luxury. This "end-matching" is typical of the scores of simple economies which might be, and are increasingly being, practiced, and the national committee is now preparing a special publication on the subject to aid in the education.

PHOTOGRAPH U. S. FOREST SERVICE

TREATING CEDAR POLES

To combat the waste of insects and decay, methods are employed to lengthen the life of the timber.

There is the use of what is known in the trade as "short-dimension" stock. Usually when a carpenter wants a small piece of lumber for a special purpose he cuts it from a long length. But back in the forest the same tree that yielded the sixteen-foot log from which the long lengths were cut yielded also many a section of shorter lengths which might have furnished the shorter stock needed. It is a part of the conservationist's new job to cut this "short-dimension" stock from such material as would not be suitable for purposes for which long lengths would be needed.

Most of the railway ties used every year are for replacement, and they amount, all told, to well over 150,000,000. In their natural state they have a life of about five years. Suppose they are treated with a preservative which will add ten to twenty, or even five years, more to that life-span. How many millions of trees would be left standing that now must be sacrificed to the God of Transportation! And how many millions of dollars would be saved in replacement costs!

By placing a quality mark on each piece of second-grade and other lower-grade lumber the producers can educate the users so that they can depend on such lower grades for purposes for which they have heretofore felt safe in ordering only the best grades. Laminated boards, built up of thin pieces glued together, may on occasion serve to even better advantage than solid pieces. New methods of crating machinery can be worked out which will save a goodly proportion of the wood now used for such purpose.

These are but a few of the lines of the new attack being made on the problem of saving the trees. We can better understand the reason for such a campaign when we learn from the authorities that hardly more than one-third of the entire tree as it stands in the forest is utilized.

They do much better in Europe. Every American soldier who served in France can testify that there is no such thing in that country as setting your foot on a snow-covered "brush pile" and shaking out of it a scared and scurrying cottontail. The idea of piling up brush to be burned in the woods would horrify the thrifty French peasant. Instead, he gathers the twigs into bundles, and in his two-wheeled cart or on the back of his wife carries them to market, where they find ready buyers. We have not yet reached the stage where we save the twigs, but we are finding it only common sense, expressed in terms of hundreds of millions of dollars, to look more carefully into the use of the body of the tree. Our grandfathers burned great piles of logs to get them out of the way. We have been burning great piles of usable "scrap." Now we must stop even that.

Interesting Things to See in February

By E. Laurence Palmer

WHILE February is the shortest month in the year it is by no means the least interesting. Certainly it has its share of national holidays and its share of changeable weather. Though the days may be growing longer the winter may, in some parts of the country, reach its greatest severity in this month. This combination of variable circumstances makes the month full of interest to those inclined to act as Nature detectives. As was the case in this section last month old numbers of Nature Magazine and numbers to come shortly may supply you with answers to some of the questions raised in case you do not have the opportunity to go directly to Nature for your answers.

I spoke above of being a Nature detective. Though facts do not back it up, gossip has it that the first President of our country had a father who was somewhat of a Nature detective. At least it is rumored that he discovered that someone had cut down a certain cherry tree with a new axe. New axes in the hands of almost anyone are potential instruments of destruction and a trip through almost any woodland will show this. Not only will it show that the individual had an axe or hatchet but it will also show whether or not the axeman knows how to use the instrument. Some trees will be hacked off as though they had been chewed. Others will be cut off cleanly. Some trees may have been trimmed so as to benefit the trees. Others may have been trimmed so that the trees have been injured. Any city street with trees will show you examples of this sort of thing. Can you detect on such trees those that have been trimmed with a saw, those that have been trimmed with a dull axe and those that have been trimmed with a sharp axe? Not infrequently you may find where the axeman used an axe with a nick in it with the result that each cut left a torn irregular line across it. See if you can find some other tree that has been cut or mutilated with the same or a similar axe as shown by this scar. A tree trimmed properly leaves a scar which can be healed without offering opportunity for the entrance of water and rot. I feel certain that you will be able to find more examples of poor tree trimming than you will of that which is good. But don't be too critical. I know from experience that it is much easier to tell someone who is up a tree how to cut off a limb than it is to do the stunt yourself.

PHOTOGRAPH W. H. STEDMAN

IT IS HARD HERE TO PICTURE GARDENS
Yet while some members of the American Nature Association enjoy scenes like this, others pick flowers in their yards.

If you live near almost any sizeable community you will undoubtedly find somewhere near it a shack which has been constructed of native material. It will be a good test of your ability to identify wood or twigs in the winter condition to examine such a shack to determine whether or not living specimens of useful species were sacrificed to meet the whim of the moment. Camp-fire Girls require in their Nature honors that where living material is used in the construction of such a shack the maker be able to identify it and show that it would not have developed into a useful timber tree. An article in Nature Magazine last winter will help you in the identification of the twigs you may find in the shack. How many useful trees do you find were destroyed in making the first such shack you find? It is appropriate that we look for these sorts of things during February not only because the month contains the birthday of George Washington whose fame as a youthful axeman has persisted but also because of the fact that the Boy Scouts of America, who include in their membership many youthful and old axemen of today, was chartered in February. When you add to this list the birthdays of Daniel Boone and that rail-splitter president, Abraham Lincoln, it becomes even more appropriate.

Since ground hog day comes in this month, it might be worth while to check up for the month the things asked for last month concerning holes in the ground. Instead of asking a friend if he has used a certain kind of soap yet or had his iron for the day or some such thing, ask him if he has reread Brooke's "The Great Lover." If you wish to send a friend a valentine just send a copy of that poem. It will be much more useful than many valentines you might buy and it won't hurt your reputation in any way. If you are looking for a short description of how it feels to really love life and to get the most from life analyze the five words in the poem which read "desire illimitable and still content." If it means nothing to you as it here stands isolated look for it in its natural setting in the poem. Then spend a few

hours of the shortest month in the year seeing how your friends and you yourselves measure up to that standard of perfection. You may find it interesting to check your own Nature interests with those of Brooke's as expressed in the poem. I know a Nature crank for example who can see no beauty in "the keen, unpassioned beauty of a great machine" simply because the machine doesn't grow wild somewhere in the woods. I don't envy the crank, do you?

I mentioned in the beginning that February was somewhat of a month of contrasts. Certainly it is if we think of it in a very broad sense. While the Northeast is shivering under its blizzards, the Northwest is beginning to pick its pussy-willows and the South is beginning to produce garden produce which it will sell in the markets of the North. It is somewhat hard for a resident of New England to picture, in early February, gardens such as he will not know for months and yet he could see these very gardens were he to travel over the country to the homes of the members of the American Nature Association. It is appropriate in connection with this thought to call the attention of readers of this section to the new section of the magazine dealing with garden hints. Those who read and heed this new section will undoubtedly find many interesting Nature topics of their own initiative.

PHOTOGRAPH BY CORNELIA CLARKE

LOOK ABOUT FOR A TWIG WITH A COCOON
You may find one and be able to bring out a brilliant polyphemus moth like this.

We have commented on the fact that though February may be a very short month it may have much of interest crowded into it. This might lead to the thought that other short things may have much of interest crowded into them. It may interest you for example to see who can find a twig not exceeding one inch in length which shows definite records of the greatest number of years' growth. This may be done with almost any woody twig. To begin with you might better first learn how to read a year's growth where the records are not crowded. After this you may try for the more complicated records. Birches, ashes, maples and apple fruit spurs frequently show records of very many years clearly though the records may be crowded into a minimum of space. Who can find a twig one inch long showing the greatest number of years' growth?

While looking about in a tree for a suitable twig you may come upon one of many kinds of cocoon made by various kinds of caterpillars. Some of these like those of the cecropia, promethea and polyphemus moths may hang the cocoons from twigs in such a manner that they swing free like a punching bag when struck by the bill of a bird. Others like those of the tussock moths may be hidden in bark crevices and still others like those of the woolly bear caterpillars or isabella tiger moths may be hidden under a stone or log. You may wish to collect some of these and watch the adults emerge. If so, let me suggest that the space between a window and a window screen is ideal for many kinds since it provides normal temperature and rain may drive in and keep the cocoons sufficiently moist. At the same time the emerging adults will be kept confined between the window and the screen. If you wish to be sure of seeing the creatures emerge, you may rig up a door bell and dry cell in such a way that the emerging moth will close the circuit and ring the bell to call the event to your attention. It might be worth while for you to attempt to learn whether or not there is a definite way to tell beforehand from which end of the cocoon the moth will emerge. Of course most of this will be found later in the year generally but you can profitably begin your collections in February.

The northern migration of birds will of course have begun in February. This will mean not only the appearance of old friends from the South but the vanishing of old friends to the North who have spent the winter with us. It is always easier to keep records of first appearances than of last appearances. Try this year to see how late such winter birds as snow buntings and their kind stay around. It is hardly profitable to list definite species since Nature Magazine goes to such a wide territory that not all can expect to find the same things in the same months. Wherever you may be though there will be an exodus of some of the winter birds during the month.

One would ordinarily think of all of the birds of a given species as either migrants or residents. But there is much evidence to indicate that with many of our birds the individuals that nest farthest north are the ones that spend the winter farthest south. The crows that linger in New England, for instance, are probably the ones that nested there, while other crows from farther north have flown high over their country, and are now spending the winter on the Potomac. Formerly we had scant means for proving this theory, only the slight differences of subspecific forms. But now we can band the bluejay that comes to our feeding table in February, and later, perhaps, find his nest in the woodlot.

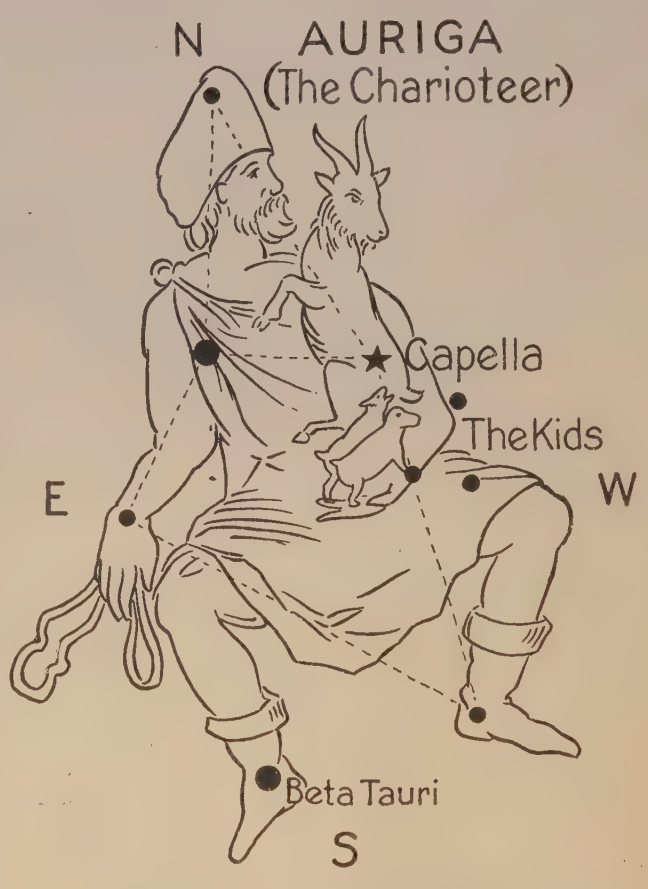
Auriga and the Skies in February

By Isabel M. Lewis

NORTH of the constellation of Orion and directly overhead at this time is Auriga, The Charioteer, so inappropriately represented as carrying Capella, The Goat, and Hoedi, The Kids, in his arms.

The early legends of the stars have no information to give us regarding the association of the goat and her kids with the chariot-driver. Indeed there seems to be some dispute as to just who this charioteer was. He may have been Erechtheus, son of Vulcan, or again he may have been Phaethon, that impetuous and daring youth who coaxed his father, Helios, to give him permission to drive the chariot of the sun across the heavens. Legend says he lost control of it and was finally cast into the Sky-river, Eridanus, by a thunder bold hurled by the wrathful Jupiter as the runaway steeds dashed so close to the earth that the mountains began to smoke and it was in danger of being set on fire.

The bright star in the left foot of Auriga, a beautiful white star, does not belong to this constellation but may be recognized as the brighter of the two stars that mark the tips of the horns of Taurus. It is known by the name of Beta Tauri. With four of the brightest stars in Auriga it outlines a huge pentagon that is one of the most conspicuous configurations of our winter skies. By far the most conspicuous object in Auriga is the magnificent golden star, Capella, which is one of the three brightest stars north of the celestial equator. The other two, Vega and Arcturus, are not above the horizon on midwinter evenings but are conspicuously in view from the spring into the late fall.



MYTHOLOGY IS AT ODDS ABOUT AURIGA
Train your telescopes on this February constellation and see what you can discover.

Capella we always associate with the little group of three faint stars to the southwest that represent Hoedi, The Kids, though strictly speaking only the two stars to the south are supposed to be the kids. The third star lies close to their heads.

Capella is a star of particular interest to us because it is a star of the same kind or type as our own sun, though Capella is a giant star with a diameter of about ten million miles while our sun is rated as a dwarf star with a diameter of only 864,000 miles. It would take more than one hundred stars as bright as our own sun to give forth as much light as Capella. Were our sun at the distance of Capella, which is about fifty light-years, or about three hundred trillion miles, from the earth, it would be a faint star of the fifth magnitude quite inferior in brightness to the faintest of the three stars in the group of The Kids.

This glorious star also differs from our own sun in having a companion sun that is not visible except in the most powerful of telescopes. The spectroscope shows the spectrum of the light of both suns, however, and in this way the existence of the second sun is known even if it cannot be seen as a point of light in the telescope. The spectroscope also shows that the two stars are revolving around each other in a period of about one hundred days and the distance between them is less than the distance between our earth and the sun. What a wonderful solar system it would be with two such brilliant suns at its center instead of one! Of course it cannot be known whether or not there are any planets circling around these two suns because the reflected light by which they would shine would be too faint to be seen by us at the tremendous distance that lies between us and the domain of this beautiful golden star that shines so conspicuously among all the brilliant gems of our midwinter skies.

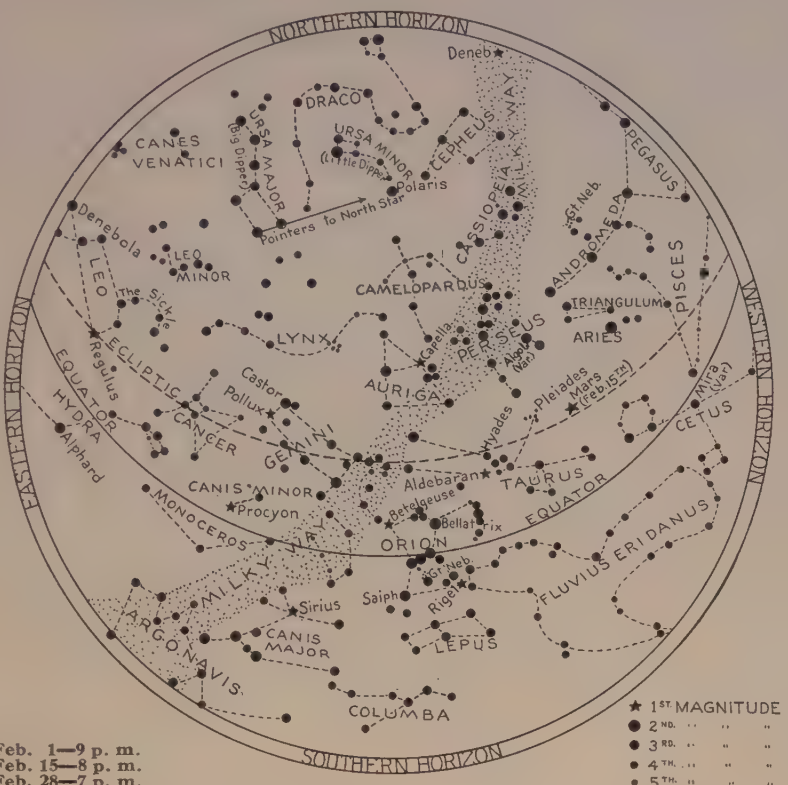
The most conspicuous constellations visible this month are Orion with his two dogs, Canis Major and Canis Minor, in the south and southeast; Taurus and Perseus in the west; Auriga overhead; Gemini high in the eastern heavens and Cassiopeia and the two Bears, Ursa Major and Ursa Minor, in the north. Far over in the southwest is the long winding river, Eridanus, marked by many faint stars and ending far below our horizon with the first magnitude star Achernar, meaning End-Of-The-River. Then there is the familiar Sickle of Leo, coming into view in the east, and the head of Hydra, the Water-snake, south of the inconspicuous Cancer in the southeast. Winter skies are the most brilliant of all the year and what a glorious assemblage of first magnitude stars we now have in the south, southeast and overhead! There are Sirius, brightest of all the stars; diamond-like Rigel, and the deep, red Betelgeuse in Orion; fiery Aldebaran in Taurus, golden

Capella overhead; Procyon, the Little Dog-star, to the northeast of Sirius; Castor and Pollux, the twins, in Gemini, still farther north and high in the east. Castor, however, is somewhat inferior to Pollux in brightness and must be classed with the second magnitude stars.

Then there are the planets, Mars and Venus in the evening sky, and Saturn visible before sunrise. Jupiter will be visible low in the southwest early in the month but will draw in too close to the sun to be seen before many days have passed and will come into conjunction with the sun the first day of March. On February 3 it will be in conjunction with the young crescent moon and the two planets will be in conjunction on February 5, Venus passing a little over half a degree south of Jupiter. Venus will also be in conjunction with the moon on the third, and the three will form a beautiful group in the western sky immediately after sunset during the first week in February. Venus has now come into the western sky to stay for some months and will be an increasingly beautiful object as the days go by and as it draws farther away from the sun and increases in brightness.

Mars is the only planet visible at the time for which the chart is given as Venus sets very soon after the sun. During the month Mars will pass from Aries into Taurus and by the end of the month will be found a few degrees southeast of the Pleiades. Although it is now decreasing noticeably in brilliancy it still ranks among the stars of first magnitude in brightness. By the end of the month it will be but very little brighter than Aldebaran, very similar to it in color, and but a few degrees distant on the northwest.

The planet Saturn is now in Scorpio and a beautiful object in the southern sky before sunrise. On the 26th it will be on the meridian due south at sunrise. The planet Mercury will reach its greatest distance east of the sun February 25 and may be seen in the western sky immediately after sunset for a few days before and after that date.



Feb. 1—9 p. m.
Feb. 15—8 p. m.
Feb. 28—7 p. m.

TO USE HOLD OVER HEAD WITH TOP TOWARD NORTH

Fig and Fence Wire

At the left is a picture of the strangler fig vine of the West Indies gradually killing a tree, and to the right a dead black walnut tree in Muncie, Indiana, victim of the strangling strands of fence wire. Frances Andrews supplies the latter picture, saying that the wire was put about the tree when it was young and that it did not give up the struggle until it was near the bearing stage. Fig or fence wire, Nature or Man; these are two interesting pictures of contrast and yet similarity in a battle for life.

PLANTING PLANS READY FOR FOREST WEEK

April 24 Center of Arbor Day Programs in Many of the States

The tree planting army now waits on the weather man in many states. As American Forest Week is April 24, at which time Arbor Day comes in many of our states, this date will see thousands of tree planting programs carried out in conjunction with the educational forestry programs. If the weather man delivers the right kind of weather the tree planters will get an early start.

One of the most far reaching tree planting campaigns is that of the Camp Fire Girls. One hundred and fifty thousand Camp Fire Girls and six thousand leaders throughout the country will take active part in the movement. Their program, in part, consists of planting shade trees, memorial trees, developing forests and woodlands and protecting the trees against fire and insect enemies. Barbara Ellen Joy, at headquarters, has worked out a plan whereby there will be a "key man" in each state. In New Jersey for example C. P. Wilbur, the state forester, has been selected. His duties will consist of furnishing help and information to New Jersey's Camp Fire Girls in carrying out their program. He feels that such an effort on the part of the girls will be real cooperation in the movement to develop and conserve New Jersey's 2,000,000 acres of woodland. The Forestry Division, of the Department of Conservation and Development, at Trenton, announces that arrangements have been completed for the distribution of forest tree seedlings to New Jersey planters at a nominal cost. Compared with previous years, the supply of forest tree seedlings is small.

* * *

States like Pennsylvania and New York are ready for the tree planters too and seedlings are ready for distribution in those states. An idea of the tree planting in New York State is given in the award of the silver reforestation cup offered to the organized game clubs of New York State by James S. Whipple, former Conservation Commissioner, to the Cortland County Sportsmans Association. The cup was given for the purpose of stimulating interest in the reforestation of idle lands. The cup was awarded by the N. Y. State College of Forestry, Syracuse University.

The Cortland County Club surpassed all other clubs in planting or causing to be planted 507,000 trees. This is the largest number of trees set out by a game club in any one year. The Shawangunk Fish and Game Association, Middletown, ranked next to the Cortland Club, with 128,500 trees. The East Aurora Fish and Game Club, Inc., was third with 117,550. The Chemung County Rod and Gun Club, Elmira, was fourth, with 100,000 trees. Other clubs stood as follows: Seneca Rod and Gun Club, Salamanca, 63,600, Cayuga County Sportsmans Association, Auburn, 50,000, Lowville Fish and Game Association, Lowville, 37,500, Jefferson County Fish and Game Protective Association, Watertown, 35,600, New Berlin Fish and Game Club, Sherrill, 5,000.

* * *

For the educational end of American Forest Week, the American Tree Association has distributed thousands of Forestery Primers that give in plain phrases the bearing forest products have on the economic life of the country. Educators have indorsed the use of the booklet in schools and women's clubs are using the Primer in their educational work. In the distribution the State foresters and the State forestry organization are helping in a fine way.

* * *

Approximately 1,500 of the 2,500 pine seedlings planted last May near Apex Gulch on the Mt. Vernon Canon road have survived and are thriving, according to a report made by Chairman Hubert L. Shattuck of the Agricultural and Livestock department of the Denver Chamber of Commerce. The trees were planted with the aid of Denver De Molay boys and U. S. Forest Service as a demonstration of reforestation. Inspection by David W. Thomas of the Chamber staff showed a 60 per cent survival which is considered excellent. The planting was initiated by the Forestry committee. Similar planting on a larger scale is planned for this spring.

* * *

R. B. Nixon and his general science class planted a young forest on the E. F. Wilson farm near East Brady, Pa. The greater part of 12,000 trees were planted. This project can be easily seen from the road. Scotch Pine, Pitch Pine, Norway Spruce and Larch were the varieties received. The Boy Scouts planted ten trees on the school grounds. All have joined the tree planting army.

* * *

At Bloomsburg, Pa., more than 40,000 trees were planted by Columbia County school children on Arbor Day. The State Department of Forests and Waters says this brings the total planted in the county in the last three years to approximately 200,000 in addition to trees which have been planted by other individuals.

* * *

At Reading, Pa., the Woman's Club marked Arbor Day by planting a Colorado spruce in honor of Rachel Griscom, Reading's first woman school teacher, whose untiring efforts in behalf of education inspired the event. A row of 12 Lombardy poplars in honor of Reading's first woman school director, Dr. Margaret Hassler, were also planted. These trees have been registered with the American Tree Association in the name of the Woman's Club of Reading, thus making the club a member.

* * *

The Good Times Club with the cooperation of the Janesville Gazette is putting on a tree-planting campaign in all the schools of Rock County, Wisconsin.

* * *

A half mile of trees has been planted on each side of the road along the Stockton-Sacramento Highway by the Soroptimist Club, Ethel M. Tyler reports. This plan for beautifying the roads of the country is being pushed in many places.

* * *

Boys of Camp Bob-White at Ashland, Massachusetts, at the direction of Ralph C. Hill, the director, have joined the tree-planting army.

* * *

Make your plans for American Forest Week now and send to the American Tree Association, 1214 16th St., Washington, D. C. for the tree planting suggestions and tree day program.

STATEMENTS FOR FOREST WEEK

TREES AND THE NEXT GENERATION

"There can be no more important educational work than turning the attention of the new generations to the importance of trees. On every hand we will see this importance if we will but look. The thing is to get us to look."—*Mary King Sherman,* President, General Federation of Women's Clubs.

AN URGENT NATIONAL NEED

"There is no more important lesson for the American people to learn than the need of growing and conserving forests and trees. Our future development as a nation will largely hinge upon the success with which we can spread this gospel."—*John J. Tigert,* U. S. Commissioner of Education.

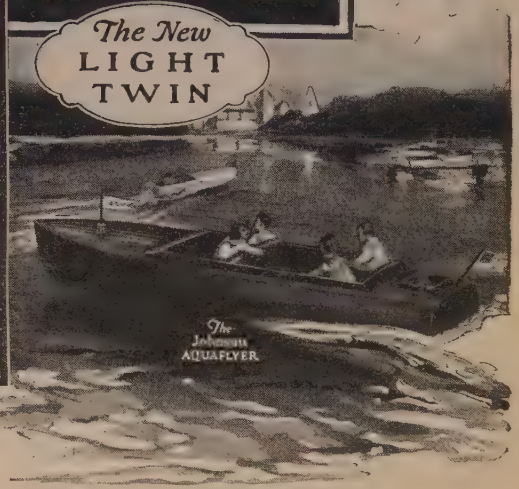
WILL UNCLE SAM LOOK AHEAD?

Now that 1926 the semi-centennial of forestry in the United States has come to a close, I like to look to 1976. Can the American people be brought to look ahead through economic glasses and see the mounting cost of living caused by our dwindling forest resources? We must put idle land to work because those resources are moving farther and farther away from the centers of greatest consumption, the populated sections of the East. A steady flow of these resources means economic independence.—*Charles Lathrop Pack,* President of the American Tree Association.

An Entirely New Standard *of* Performance *in* Outboard Motors

The New LIGHT TWIN

The New STANDARD TWIN



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A 17 ft. mahogany hull runabout that completely changes all previous conceptions of water-motoring performance.

The Aquaflyer offers for the first time, automobile comfort and luxury, combined with maximum safety, speed and beauty of design without precedent in the outboard field. In initial maintenance and operation costs it has no counterpart.

Equipped with a Johnson motor installed in a patented sound-proof hatch at the stern. Speed to 18 m. p. h. with two persons; to 14 m. p. h. with four persons.

A beautifully illustrated brochure presenting full description and specifications of the Aquaflyer will be mailed upon request. Write for your copy at once.

IT was a Johnson Motor that revolutionized the design and performance of outboard motors five years ago.

Today, three *new* Johnson Twin Motors, again set a *new* standard of power smoothness . . . a *new* measure of motor efficiency . . . a *new* degree of riding comfort.

The driving or propelling force *is increased* 40% in the *new* Light Twin, due to a greater reduction gear ratio, and with a material increase in power.

The *new* Big Twin, with 21% greater piston displacement, and a four-port design motor, *is increased* 33% in power. Speed ranges to 27 miles, or better, per hour.

An *entirely new* model—the STANDARD TWIN—is announced. It is more powerful and faster than the Light Twin—making 20 miles per hour. Yet, it is easily portable.

Gracing all Johnson Twins is a *new* streamline lower unit which reduces water resistance, is simpler in design, and three times more sturdy

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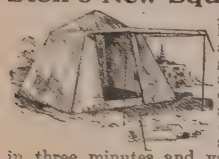

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NATURE NEWS AND VIEWS

An Astronomy Hall

Astronomy has too often been presented in forms that mean no more to the layman than the hieroglyphics of the ancients. It has scared away many people from one of the most fascinating of studies. We have fine observatories in the United States and astronomers of international rank, but we have long needed what would amount to a people's observatory and a popular astronomy studio for the layman. This need the American Museum of Natural History proposes to fill, which is equivalent to saying that the need *will* be filled in every sense of the word.

The new building will be five stories in height and situated in the very central part of the system of buildings. It will be adapted and dedicated not to technical astronomy, but to a popular treatment of the subject. Space does not permit detail about the proposed construction of the hall, but it is sufficient to say that the astronomical genius of the astronomer-artist, Mr. Howard Russell Butler, will be largely drawn upon, with the cooperation of Dr. G. Clyde Fisher, in charge of Astronomy for the American Museum.

Snowy Owls Come South

The present winter is witnessing the largest flight of these northern visitors that has appeared for many years. The snowy or Arctic owl is circumpolar in range, breeding in practically all the lands north of the tree limit as far as man has penetrated. In its summer home it lives on mice, lemmings, weasels, and probably the Arctic hare, as well as on the myriad birds of shore and water which at that season are abundant. But winter spells a different tale. Then the small birds migrate southward, and the mice and lemmings work mainly beneath the deep snow, so the owls must leave. Usually they go only a few hundred miles down into the wooded country, not for shelter, for they are feathered thickly to bill and toes, but that they may find food. There the varying hare is their principal stand-by. Now this hare, generally called the white rabbit, is famous for its great fluctuations in numbers. For a few years it will be exceedingly abundant, and then, through disease, it will almost disappear. And although we have not yet learned that the present winter has lost its rabbits, for their

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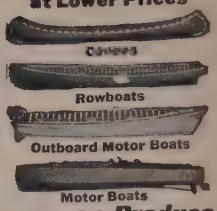

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land is mainly beyond ready communication, it is highly probable that an unusual scarcity of these animals is responsible for the abundance of these rare owl visitors. From all over our northeastern states, and as far west at least as Minnesota, reports of their occurrence have come. They are most abundant near our coast and have already been reported as far south as Maryland and northern Virginia. Hundreds have been seen in the New England states, and some have alighted on ships far out in the Atlantic. In the region about Washington, D. C., several have been reported; the last notable previous flight which reached this section occurred just fifty years ago.

The snowy owl is nearly pure white throughout, usually with much barring and spotting of grayish brown. Contrary to common report, its spread of wing seldom exceeds five feet. Most of these visitors from the north are probably killed, for few gunners can resist the temptation to try so fair a mark. From a purely economic point of view, however, apart from their beauty and general interest, they are worthy of protection, for while with us they seldom kill game birds, other than crippled individuals, and they take heavy toll from the rats and mice.

We shall be glad to receive word of the occurrence of this notable Arctic visitor from any of our readers living south of Pennsylvania, Ohio and Illinois, as well as from the western states generally. E. A. P.

For the Aquarists

Apparently a considerable interest has been aroused among our members by the recent article in NATURE MAGAZINE on the keeping of the home aquarium. Many requests have been received for references to additional literature and such references would not be complete without mention of a competent little publication of British origin know as *The Amateur Aquarist and Reptilian Review.* It is a quarterly and the official organ of the British Aquarists' Association. A. E. Hodges, F. Z. S., is the editor. The little magazine is extremely practically prepared and should be invaluable to anyone with a home aquarium. It is possible to join the Association and receive its publication for two dollars a year. Remittances should be made in the form of money orders or cheques payable in London. The Aquarists' Association has grown rapidly and has several branches in various parts of England, while the magazine has recently been enlarged in recognition of its increased scope.

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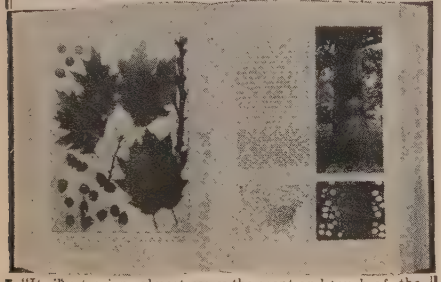

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Mr. Nathan, Please Note

Several entries in the Bird Songs Contest were received too late for inclusion in the contest, and we wish to thank these contributors for their interest. There have been various other reverberations of the contest and some entertaining observations.

Mr. Charles Roome Parmele writes that he is reading a book on the life of Walter Damrosch, the musician, who tells of a visit to Liszt, the famous composer and pianist. They were seated in the latter's garden, and Dr. Damrosch mentions the unspeakable beauty of the sounds which came from the throat of a nightingale in one of the nearby bushes. Both he and Liszt were entranced by the beauty of the song. Mr. Parmele expresses regret that Mr. George Jean Nathan could not have been among those present.

Miss M. E. Wilson writes of attending a concert on the campus at Columbia University one summer evening. The band played the first number, in which there was considerable trilling. It was an outdoor concert and in a tree above was a bird which joined with the band and trilled every note in tune and time. The entire audience turned its attention to the bird.

Advice from an Expert

One of the most competent Nature photographers in this country is Stanley C. Arthur, Director of the Division of Wild Life of the Louisiana Department of Conservation. Mr. Arthur has not, perhaps, published his photographs as widely as some of the others in the field, but his work has been marked by its distinct value and thoroughness. Advice on photography from Mr. Arthur, therefore, has its distinct importance and we are interested to receive his reaction on the relative merits of motion picture cameras.

During the past seventeen years Mr. Arthur has made motion pictures of wild life over a territory stretching from Louisiana to Labrador, using motion picture cameras of virtually every make except the comparatively new Eastman Kodak Company product. He says that during this period he has watched the evolution of the motion picture camera, always advocating a small, compact type that would crank itself. "Today," he says, "I am using in the field the only practicable 35 mm movie camera I have yet handled and it looks as though my prediction and dreams have come true."

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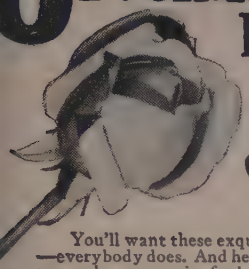

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A Cordial Invitation

Members of the American Nature Association who live near Miami, Florida, or who are fortunate enough to be visiting or vacationing there, are cordially invited to join with the members of the Southern Cross Observatory in their amateur astronomy work. The observatory was opened January 1 by S. Lynn Rhorer, its generous founder, and we understand that it holds its astronomical fiestas in Royal Palm Park evenings between the first of the year and March 15. James J. Marshall, 501 Realty Board Building, Miami, is secretary of the observatory and can give members any information about its activities. He writes that "we are a highly informal group of amateur astronomers and good fellows (including the ladies) who offer the use, this year, of five 5-inch Clark refractors to the public to view our marvelous southern skies." The cooperation of interested enthusiasts is desired to help the numbers of absolute laymen who are becoming interested in the skies through the observatory work.

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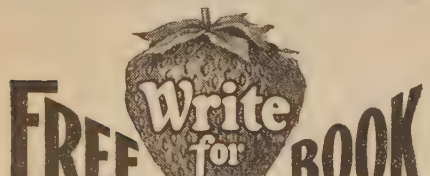

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Augustana Memorial

According to the records, Augustana College at Rock Island, Illinois, contributed more men for the war forces of the United States in proportion to its enrollment than any other educational institution in this country. Eight of these men gave up their lives in the service, and on Armistice Day a memorial was dedicated to these men in the form of eight elm trees that will stand on the college campus. The memorial was established under the auspices of the Roosevelt Outing Club, which wisely selected one of the finest memorials imaginable,—a growing, living tree.

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Foster Parents

By Julia M. Harrison

The usual colony of English sparrows were making themselves at home—without invitation—on our premises last summer. Cheeky, common, untidy, they littered up the porches with their nests, preempted the bluebird houses and policed the entrance to the wren box. We were to learn, however, that these vulgar little plebeians were capable, on occasion, of generous conduct which put to shame some of their more cultured neighbors.

Late one afternoon we were called outside by the insistent clamor of a brood of fledglings demanding food. To our surprise we found, scattered about the lawn four little yellow warblers—evidently out for the first time. The parent birds were not in sight, and the youngsters were calling with a lustiness and persistence that denoted extreme need. Relief was coming, however, from an unexpected quarter. A sparrow arrived on the scene and somewhat hesitantly approached one of the babies with an offering. It was promptly accepted. The relief party was augmented by the arrival of a second sparrow—presumably the mate—with a titbit for another gaping mouth. Those two sparrows adopted the starving family on the spot, and proceeded to devote themselves to the job of filling the four empty "tummies." All through the late afternoon and until darkness ended the operations they hurried back and forth with supplies. We dared not get close enough to see what rations were being provided, for fear of putting a stop to the proceedings. It is probable, however, that a yellow warbler mother, accustomed to providing for her brood a carefully selected diet of grubs and worms, would have been in despair had she seen the assortment of viands that went down those babies' throats. The little orphans, however, accepted everything without question, possibly assuming that it was mother's day out and that this was a good opportunity to experiment.

The next day, one of the babies was missing, but the three remaining were still cared for by their self-appointed foster parents who, so far as we could determine, brought them safely through to independence.

Where the brood of warblers came from we do not know. The nest had escaped our notice. And what accident could have deprived them of both parents we cannot even surmise. At any rate, it is to the credit of their little cockney neighbors that their babies did not die of starvation.

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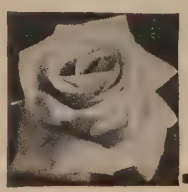

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Sidelights on Sharks

By Celeste Gillette

I was sitting in a boat fishing and wondering why the fish wouldn't bite. Mother called me, and said, "Hurry!" I jumped out of the boat on the float, nearly falling over backwards into the water. Mother told me to run over to Auntie Amo's; so I went. Auntie Amo took me next door and down on the float. Jack Vibert had a fisherman friend who gave him a thirty-pound leopard shark. It had spots all over its body. The shark was in height four feet. Its back was a grayish white with spots, and its front was pure white. It was having babies. It had two just before I came, and Jack put them in a pail of water. The baby sharks looked like their mother, but attached to their bodies was a red string, and at the end was a yellow ball with funny red veins through it. It had two more baby sharks while I was there. It was very interesting.

While I was on my way home Mother told me that the yellow ball was what the baby sharks feed on until they are able to look after themselves. Mr. Vibert put the shark back in the water as it was only a leopard shark and wouldn't hurt any one. It was caught at Balboa, California, or New Port, in which the town of Balboa is.

As Nature Sows

Two weeks of wonderful Indian summer weather late in October and early in November," says the *Nature News Notes* of Mount Rainier National Park, edited by F. W. Schmoe, Park Naturalist," caused the cones to open and release their winged seeds to replenish the earth with trees. Should one seed to every one hundred square feet of surface germinate and grow into a tree our forests would be so dense that no sunlight would filter through to the ground. Should one out of every ten of these survive to the age of one hundred years the cruisers of future generations would no doubt tally more than a hundred thousand board feet to the acre. It would be a wonderful forest of tall straight-boled giants. But how does nature plant her trees? On the smooth surface of a well packed trail through the forest the Naturalist counted an average of more than one hundred seeds to the square foot beneath the parent trees, and more than fifty to the square foot a hundred feet or more from the trees. Nature plants ten thousand seeds where only one or two can hope to grow."

ON SHINY WINGS
By Helen Von Kolnitz Hyer
Introduction by Paul M. Rea
Illustrated by R. Bruce Horsfall

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Report of Progress

Progress in forestry under the provisions of the Clarke-McNary law which authorizes and directs Federal cooperation with the states, and which became effective the past year, is evidenced in the annual report of the Forest Service, United States Department of Agriculture.

This movement to link the Nation and the states in a united effort to develop timber growing on the widest possible scale, especially on private forest lands which make up 80 per cent of our total forest area, has inspired many states to greater activity, according to the report. Forty-one of the forty-eight states and the territories of Hawaii and Porto Rico are now cooperating with the Federal Government under one or more sections of the law.

A Faithful Robin

It was thought that all the robins in the vicinity of Oshkosh, Wisconsin, had hied away for southern climes in late October. Two of them did not, at least, according to an item in the *Minneapolis Journal*, called to our attention by Mrs. F. W. Thurston of Anoka. In the woods near Oshkosh, two robins were found, the female bird too crippled to fly and the male, contrary to alleged infidelity among birds, facing certain death by starvation, stayed at the side of its mate. Father robin was already weak and cold from hunger, but those who found the couple built them a temporary home that is to be completed by Boy Scouts, who will see that the birds are supplied with food this winter.

A Rare Visitor

It was the last day of September, writes C. R. DuFour, M. D., of Washington, D. C., when, with a friend, he was standing looking out over McPherson Square in the heart of the city and watching a pair of white-breasted nuthatches foraging through the elm trees. He continues:

"The English sparrows were very curious about them, would congregate around them, but made no effort to attack them. When one of the sparrows came too close, the nuthatch would ruffle up his neck feathers and showed fight. While watching

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Andrew S. Wright of 95 Ingersoll Grove, Springfield, Massachusetts, would like to purchase some baby turtles of various species. He emphasizes the word baby. Have some of our members baby turtles?

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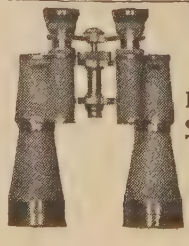

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them, I saw a bird flying towards my window. He lit upon the window sill within arms length of us; so near that had he permitted it, I could have taken him in my hand without moving from where I stood. I was amazed to see this bird here in the city. He was so close that I easily made out his markings. He sat with his breast toward me. It was yellow, his belly was white, a white line through his eyes a little yellow in front of eye, white wing bars, white streaks on wings, a white patch on each cheek and a blackish forehead. No doubt this bird is recognized from this description. It was a yellow throated warbler. He remained on the sill for several minutes, then flew away."

A Nature Puzzle

By Alice B. Joynes

The following Nature Puzzle conceals a slogan of four words. The answer will be published in the March issue of NATURE MAGAZINE.

My first in dogwood is not in mulberry.
My second in hickory is never in cherry.
My third in maple, aspen, and pine.
My fourth in the poplars standing in line.
My fifth in mahogany and Indian bean.
My sixth in linden is quickly seen.
My seventh in butternut is not in beech.
My eighth in banana and also in peach.
My ninth in chestnut is plain to behold.
My tenth in orange with fruit of gold.
My eleventh in elm, blooming in March.
My twelfth in hemlock but not found in larch.
My whole is advice no one should scorn.
Reject it—our landscape may soon look forlorn.

Answer to January Puzzle
REFORESTATION

Questions and Answers

The American Nature Association will be glad to answer each month such questions as its members ask about Nature.

QUESTION: *I am interested in the introduction of the English Sparrow into this country. What are the facts?—L. C.*

ANSWER: According to the best information obtainable the first English Sparrows, eight pairs of them, were brought to this country in 1850, and were liberated in Brooklyn, N. Y., in the spring of 1851.

QUESTION: *Will you please tell me the best way of treating a rattlesnake skin in order to preserve its beauty?—J. P. D.*

ANSWER: It is usually impracticable to treat *soft* a snake skin, as the necessary manipulation results in the loss of the scales and much of the beauty. The skin may be cured with salt and alum, however, and will then retain its scales, though it will be somewhat stiff.

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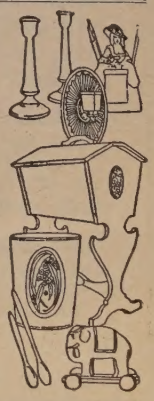

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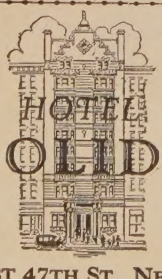

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QUESTION: *Please give me some information concerning the growth and habitat of the mistletoe.—O. M. S.*

ANSWER: The eastern mistletoe is a parasitic plant which grows on the branches of such trees as oaks, maples and black gums, rooting in the wood of its host and deriving its nourishment from it. It blossoms in late fall, and matures its berries the following fall. It is rather southern in range growing from New Jersey and Pennsylvania, southward. Other species with similar habits occur in our southwestern states.

QUESTION: *Will you be kind enough to let me know where I can get some information as to how to build a "Battery" to attract bats?—R. R. P. Jr.*

ANSWER: While roosts built to attract bats in large numbers have sometimes been successful, this has been only within the range of certain southern species which habitually roost in large colonies. None of these species occur in your region (South Carolina) and it is not likely that a "battery" will prove profitable there.

QUESTION: *Can you tell me something about the white Arctic owls that have recently been found in Connecticut and the vicinity of New York?—H. C. S.*

ANSWER: The Arctic or Snowy Owl, *Nyctea nyctea,* nests in the Arctic from Greenland to Alaska. Its natural food consists of birds and mammals. When winter comes and the small birds migrate, the owls live mainly on mice and rabbits. In certain years rabbits become scarce and this is believed to be the cause of the owls coming so far south in search of food.

QUESTION: *I would like to know what crickets eat.—L. H.*

ANSWER: Crickets eat most any vegetable matter, and sometimes injure cloth left in their haunts.

QUESTION: *What do squirrels eat when there aren't any nuts?—L. H.*

ANSWER: Squirrels eat the buds, flowers and bark of trees, in the absence of other food.

QUESTION: *I have a pair of Tumbler Pigeons. They laid three eggs and are hatching them. Could you tell me how the old pigeons get the food for their young ones when they are shut up in a coop.—E. H.*

ANSWER: Pigeons usually lay only two eggs before starting to incubate. The young are fed on what is called pigeon's milk, which is a product of the crop of the old bird, and results from the partial digestion of the food by the parent. This is pumped down the throat of the young one by the parent. The process is called regurgitation, and many birds feed their young in this manner.

QUESTION: *I would like to know how long the robins and sparrows live, also what color they are when they are born.—R. A.*

ANSWER: Not very much is known about the ages of our birds on account of the difficulty of recognizing the same bird year after year. Probably some of our smaller birds such as robins and sparrows live for ten or fifteen years. When they are hatched they have no feathers, and their skin is a brownish pink.

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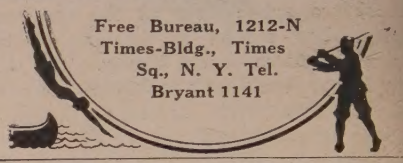

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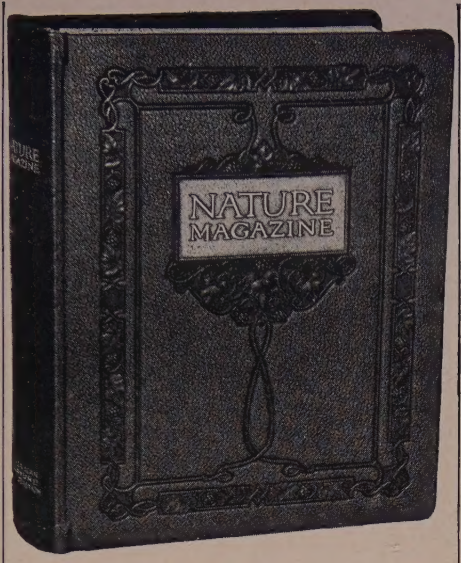

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